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Railway Service to Traveller and Trader

THE aspects of railway service best adapted to publicity are not always those which are the best argument for supporting the companies as a vital factor in our economic life. Many of these less evident considerations were emphasised by Mr. Ashton Davies, Chief Commercial Manager, L.M.S.R., in an address to the Birmingham section of the Institute of Transport on November 12. The keynote of his theme was the universal adequacy and constant availability of the transport offered by the railways. These features were maintained in spite of fluctuations in demand, and involved not only a huge investment in equipment, but much working of empty stock in one direction in order to cope with heavy traffic in the other. The transport of passengers involved equally severe obligations, as an instance of which Mr. Ashton Davies quoted the fact that out of 240,000 persons arriving at the London termini of one company between 7.0 a.m. and 10.0 a.m., about half did so during one peak hour. The expense and arduous conditions of working imposed by these characteristics of our industrial and social organisation have to be met by the railways because they are the only transport medium physically capable of providing essential services of such magnitude. The railways, as Mr. Ashton Davies remarked, maintain full availability of service for all comers, at all times, to anywhere, whereas road transport is bound to be selective.

Book Service on the Silver Jubilee

The L.N.E.R. has this month inaugurated an experimental library service for passengers on the Silver Jubilee express, whereby copies of new books may be obtained on loan from a train attendant for the duration of the journey. Readers who find that streamlined travel outstrips their speed of assimilating fiction can buy their own copies at station bookstalls at King's Cross, Newcastle, and Darlington. We would take the opportunity of co-operating with the publishers concerned by pointing out that this will prove a cheaper and more acceptable method of finding out what happens on the last page than will misguided attempts to protract the period of tenure by pulling the communication cord at a critical passage. The library service was inaugurated at King's Cross on November 7, when Lady Wedgwood, herself an author, presided over the ceremony (see illustration on page 882). The first volumes were chosen respectively by *The Daily Mail* and *The Evening Standard* as the best books of the month.

* * * *

The Week's Traffics

Passenger train traffics of the four amalgamated companies for the past week show decreases or comparatively small increases, and this may to some extent be accounted for, as indicated a week ago, by diversion of traffic to parcels post, and by reduced railway rates to cope with this new competition. Fears of a coal strike also accounted for some of the continued increase in coal class traffics. Aggregate traffics of the four companies together for the 46 weeks amount to £133,509,000, an increase of £1,142,000, or 0·86 per cent. Combined passenger train traffics to date have reached £60,509,000, an improvement of £1,217,000, or 2·05 per cent. An aggregate net increase of £37,000 is shown by the four companies in merchandise receipts, and the aggregate net decrease in coal class earnings has been reduced from £141,000 to £112,000.

	46th Week				Year to date	
	Pass., &c.	Goods, &c.	Coal, &c.	Total	Inc. or Dec.	%
L.M.S.R.	— 11,000 +	14,000 +	6,000 +	£ 9,000 +	£ 665,000 +	1·25
L.N.E.R.	— + 1,000 +	2,000 +	15,000 +	18,000 +	103,000 +	0·26
G.W.R.	— + 4,000 +	4,000 +	8,000 +	8,000 +	189,000 +	0·85
S.R.	— + 4,000 —	3,000 —	— +	1,000 +	185,000 +	1·03

Great Northern (Ireland) receipts to date show an increase of £49,700, and those of the Great Southern are £135,110 up.

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Peruvian Corporation Railways

The railways and the connecting steamers on Lake Titicaca, which are owned by the Peruvian Corporation, afford important international communications in Peru and Bolivia. During the year ended June 30, 1934, there was a slight improvement in the railway receipts, and this was well maintained during the year ended June 30 last, but debenture interest arrears are still substantial, and the stockholders have agreed to extend the present moratorium until 1938 if need be. Net traffic receipts of the Central Railway, the principal revenue-earning system in Peru, amounted in 1934-35 to £96,681, an increase of £30,696, due mainly to the activity in the mining industry. Road competition for goods on this system is being successfully met by collection and delivery services in and around Lima and a combined road and rail service between Lima and points in the interior beyond the railways. On the Southern Railway in Peru, which is connected with the Guaqui-La-Paz Railway in Bolivia by steamers on Lake Titicaca, net receipts have fallen from £56,345 to £47,973 partly because of Bolivian exchange restrictions, and the lake steamers and the Guaqui Railway suffered from the after effects of the Bolivia-Paraguay war.

Derailed through Landslips

On the morning of Sunday last, November 17, an empty milk train was derailed between Winchfield and Hook on the Southern Railway as a consequence of the track having been distorted by a landslip. This prompts mention of the fact that cases of flooding of the permanent way, slips, and similar mishaps, have to be reported to the Ministry of Transport. These appear under a common heading in the accident returns, and those for 1934 show that, since 1920, the average each year has been 25. They vary, of course, each year, and in 1932 the number was as high as 136. Until the present accident there have been only three derailments during the present century that have called for an inquiry by the inspecting officers, of which the most serious was that of January 19, 1918, at Little Salkeld, when the Midland down day Scottish express was derailed and seven passengers were killed. At Tir Phil, on the old Rhymney section of the Great Western Railway, a subsidence of the line, on January 3, 1925, caused a freight train to fall down an embankment, and the two enginemen were killed. The third case was the slip of the mountain side at Fairbourne, G.W.R., on March 4, 1933, that caused the derailment of a mail train and the death of the driver and fireman.

* * * *

Overseas Railway Traffics

The most gratifying feature in Argentine railway traffics in the past fortnight has been the increase of £38,747 in the gross receipts of the Central Argentine which has brought its decrease for the 20 weeks of the current year down to £4,714. On the Buenos Ayres and Pacific the improvement in the two weeks has been £12,674, but the Buenos Ayres Great Southern has had a setback during that period and has added £12,085 to its previous aggregate decrease, and the Buenos Ayres Western is down by £419 net in the two weeks. The Entre Rios has a decrease of £2,668 for the past week, but is £6,056 up on the year. For the 20 weeks the Argentine North Eastern shows an increase of £12,236 and the Cordoba Central one of £9,270.

	No. of Week	Weekly Traffics	Inc. or Decrease	Aggregate Traffic	Inc. or Decrease
Buenos Ayres & Pacific	20th	72,855	+	1,242	1,472,897 + 105,046
Buenos Ayres Great Southern	20th	112,926	-	10,358	2,375,049 - 37,753
Buenos Ayres Western	20th	45,123	+	548	783,405 - 31,349
Central Argentine	20th	116,384	+	12,965	2,355,517 - 4,714
Canadian Pacific	45th	531,000	+	22,800	22,349,200 + 571,200
Bombay, Baroda & Central India	32nd	229,800	+	7,725	4,741,425 -

Canadian Pacific gross earnings show an advance of £54,000 in the past two weeks.

* * * *

High-Speed Trains Bring New Business

The annual meeting of the American Association of Passenger Traffic Officers at Cincinnati last month was the first to be held since the widespread introduction of high-speed trains in America. The results of such services were therefore prominent in the reports presented, and to their popularity was ascribed the pronounced advance in passenger revenue recorded in the past year. Not only were remunerative loads maintained and improved upon during the summer, but many of the bookings represented new business. The Hiawatha and "The 400" services have been particularly successful in this respect, one-third of the passengers on the former and one-half on the latter being new traffic. The Hiawatha has been earning \$3.65 a mile, and far from robbing other services, its operation has been accompanied by an all-round increase in passenger movement between Chicago and the Twin Cities. Chicago & North Western passenger revenues on the system as a whole have improved by

7 per cent., but "The 400" has increased its business by 78 per cent. since its introduction. The City of Portland of the Union Pacific is estimated to have taken one-fifth of its business from the roads, and one-third of the business on the Kansas City-Salina services comes from the same source. The Flying Yankee of the Boston and Maine ascribes 5.7 per cent. of its recaptured business to airline patrons, and 13.2 per cent. to former bus users.

* * * *

The Appeal of Speed

The satisfactory results of high-speed services mentioned in the foregoing note must be considered in the light of other factors quoted at the American passenger traffic managers' conference. The appeal of novelty is still strong, for on one occasion when a steam train of orthodox type was substituted for a Union Pacific streamline service, business on the route fell off considerably. This may have been due in part to the superior accommodation of the streamlined stock, although the fact that on several occasions crowds of 250 insisted upon travelling (standing, or sitting on each other's laps) in a train designed to seat 112, suggests that comfort and convenience are not yet everywhere the prime factors in promoting patronage. The C. & N.W. week-end high-speed service, the Flambeau, to the North Woods of Wisconsin, was regularly duplicated at the height of the season, and the company justifies its contention that traffic is being regained from the roads by the fact that some of the passengers have driven up to 40 miles by car to join this and similar trains. But whatever the motives inspiring this patronage, there seems no reason why it should not be retained after the novelty of high speed has worn off. The companies are trying to make sure of this by improving accommodation and extending air-conditioning, and although the demand for the latter has been embarrassing at times, it is a healthy sign that the public shows so keen an appreciation of one of the less spectacular railway amenities.

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Sale of the Lynton and Barnstaple Railway

The final episode in the chequered history of the Lynton & Barnstaple Railway took place on Wednesday, November 13, at the Pilton depot, when the rolling stock, locomotives, and materials of the line came under the auctioneer's hammer. The lines outside the carriage and engine sheds presented an extraordinary appearance with the whole of the rolling stock on view to prospective purchasers, who examined the various "lots" with a familiarity and thoroughness that was most annoying to those whose recollections of happy holidays were associated with the little railway. The sale was held in the old carriage shed, the walls of which were hung with mats and other small articles. Bidding for the larger items was not so keen as for the smaller lots, the five locomotives making only from £34 to £52 each. Four of the locomotives were purchased by John Cashmore Limited, the well-known iron merchants and shipbreakers of Newport, Mon., and the fifth by a London firm. The carriages were also disposed of at very low figures, varying from £10 to £13 10s. each. The track was withdrawn at 2s. a yard for sale by private treaty. Among articles purchased for souvenirs, a first class carriage mat fetched 7s. 6d. The locomotive nameplates (*Exe*, *Yeo*, *Taw*, *Lew*, and *Lyn*) were not included in the sale, however, as they were to be sent to the Railway Museum at York. Other items of interest included eight 4-ton 4-wheel open goods wagons (£3 15s. each); a spare locomotive boiler (£20); two 4½-ton cranes (£30 and £29); 5-ton weighbridge (£29) and the signal cabin, with signals, at Lynton (£7). Bidding for materials was more competitive, steel scrap making 42s. a ton.

Removal Without Demolition

The demolition of buildings to make way for new ones is a common process now that developments so often outstrip the conceptions of the original designers. Expansion of this kind has inspired the present scheme for rebuilding Euston station, L.M.S.R., and here there is a case where not the demolition but the removal of a building is called for. The example in question is the Doric entrance arch, which although a fitting approach to the station when the principal access was from Euston Square, is so far removed from the present entrance in Euston Road that it has come to be regarded as a curiosity rather than a main portal. Interesting possibilities are therefore suggested by a recent feat in America, when a five-storey building, which it was desired to remove but retain, was hauled intact for 160 ft. over a pile-supported runway consisting of 600 steel spools. The structure concerned was a reinforced concrete building at New Orleans, and weighed 5,000 tons. Motive power was provided by a 10-in. x 12-in. steam engine working through one set of 8-sheave blocks and an emergency set of 4-sheave blocks. A practically uniform pull of 338,000 lb. was required to keep the building moving, and the total time for covering the 160 ft. was 1 hr. 58 min. This, however, included stops for adjusting cables and spools, the actual travelling time being 20 min. The whole operation is described by Mr. C. Glenn Cappel in our American contemporary, the *Engineering News-Record*.

* * * *

The Cost of Delays

In a paper of exceptional value delivered on October 18 at the New York Railroad Club by Mr. A. H. Kandee, on "Why the Diesel Engine is Taking its Place as an Economical Railroad Tool," certain information of great importance was given in regard to the possibilities and difficulties of high speed operation. By taking the trouble to overcome certain supposedly insuperable difficulties, and with comparatively small outlay, many of the possibilities could be realised. For example, Mr. Kandee gave figures to show that, on a 400-mile high-speed run, for 42½ miles of which speed was restricted to between 70 and 80 m.p.h., 48 minutes could be saved if a speed of 90 m.p.h. were permitted. To prove, however, that high speed is not necessarily the answer to the demand for fast schedules, Mr. Kandee pointed out that the cutting out of only one restriction of 20 m.p.h. and one of 15 m.p.h. would more than equal the boost in speed over this 42½-mile section. In the same 400-mile run it was shown that, inclusive of the time lost by intermediate stops, as much as 60 minutes were consumed by speed restrictions. Nothing could show more impressively the importance of reducing speed restrictions to an absolute minimum—and we class as speed restrictions not only those necessitated in the interests of safety, but those due to signal checks, most of which arise from late running.

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Restaurant Car Ventilation

Four railway officers are on the committee of the Hotel Restaurant and Catering Exhibition, which opens at Olympia on November 29. They are: Mr. Arthur Towle (Controller of L.M.S. Hotel Services), Mr. J. E. Ryan (Hotels Superintendent, Southern Area, L.N.E.R.), Mr. R. W. Turier (Assistant Controller, Scotland, L.M.S. Hotel Services), and Mr. Noel Taylor (Hotels Manager, L.M.S.R., N.C.C.). Judging by the other bodies represented, among which are the Réunion des Gastronomes and the Incorporated Association of the Purveyors of Light Refreshments, the deliberations of this committee are among the few of the kind which it

would be a pleasure to attend, but railway travellers will be disappointed if the art of catering is allowed to engage the whole attention of the assembled company. Whatever culinary innovations are subsequently seen in restaurant cars, it is to be hoped that the catering departments will specify better ventilation. All too often the atmosphere in these vehicles first jades and then embitters the appetite, until it refuses to respond even to the titillations conceived by the "star chefs of five countries" who, we are told, are to give a special display at the exhibition. The ideal would, of course, be complete air-conditioning as now adopted in America.

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Changes on the Clyde

An epoch in the history of the steamer services has closed with the disappearance, as a separate organisation, of the "White Funnel Fleet." From the beginning of October, the seven steamers operated by John Williamson & Company and Turbine Steamers Limited, including certain of the fastest vessels on the river, and among them the *King Edward*, built in 1901, which was the first turbine-propelled ship on the Clyde, passed into the hands of the L.M.S.R., the Caledonian Steam Packet Company, and David MacBrayne Limited. The *King George V* and the *Queen Alexandra* have been taken over by MacBraynes, and regretful memories are stirred by the fact that the former is to replace that grand old Clyde veteran, the *Columba*, which, after 57 years of continuous service on the Inveraray run, is at long length to be retired. As the *King George V* is a faster ship, it is possible to combine the Tarbert, Ardriishaig, and Inveraray services into one sailing in each direction; the *Queen Alexandra* takes over the Campbeltown run. The other five ships are incorporated in the fleet of the L.M.S.R. and its associated Caledonian Steam Packet Company. The L.M.S.R. is also taking over the ferry service between Gourock and Kilcreggan, on the promontory between the Gareloch and Loch Long, and a larger motor-boat is being built for this service than the one which has hitherto been privately operated.

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L.M.S.R. 4-6-2 Prowess

During a recent return journey to Liverpool, we noted two excellent performances by engines of the latest batch of Pacifics with large superheaters. On the 6.5 p.m. down, loaded to 505 tons gross behind the tender, No. 6212, *Duchess of Kent*, passed Rugby, 82·6 miles, in 81½ min., having averaged 69·3 m.p.h. over the 48·6 miles from Tring to Hillmorton. This included a sustained 76½ m.p.h. on a falling gradient no steeper than 1 in 1,683. Mossley Hill 189·6 miles, was reached in 196 min.—four min. early—or 194 min. net. On the 5.25 p.m. from Lime Street, which runs the 152·6 miles from Crewe to Willesden at a start-to-stop average of 64·5 m.p.h., No. 6208, *Princess Helena Victoria*, was loaded to 470 tons gross. Rugby, 75½ miles from Crewe, was passed in 71½ min., speed having averaged 68·8 m.p.h. over the 46·2 miles from Milford to Rugby No. 7 box. This stretch included a sustained minimum speed of 64½ m.p.h. up the 1 in 320 bank south of Nuneaton. After passing Sears crossing, 120 miles in 110½ min. from the start (an average of 65·4 m.p.h.), came a check to walking pace at Cheddington, but from this the engine accelerated to 52½ m.p.h. in 4 miles of 1 in 335 ascent. The Crewe-Willesden run was completed at a net average speed of 66·4 m.p.h., the total net time being 138 min. On both runs the quietness of the exhaust was a sure indication of good driving, both engines in fact being worked for long periods at no more than 15 per cent. cut-off.

The Nigerian Railway

WE have received from Mr. G. V. O. Bulkeley, C.B.E., General Manager, a copy of the annual report of the Nigerian Railway for the year ended March 31, 1935, which contains much interesting information. The railway is 1,900 miles long; its gauge is 3 ft. 6 in. except for a short branch line which is of 2 ft. 6 in. gauge. It works in hilly country and the line rises to a height of 4,500 ft. In many respects the Nigerian Railway is well equipped. The automatic vacuum brake is fitted to all freight stock and the latter is equipped with automatic couplings which are the same pattern as those on the coaching stock. The workshops are of modern design and equipment and are now being described and illustrated in THE RAILWAY GAZETTE. The first two instalments of the series of articles, by Major M. P. Sells, Chief Mechanical Engineer, appeared in our issues of October 11 and November 8.

The following are some of the principal statistics:—

	1932-33	1933-34	1934-35
Gross receipts ..	£ 1,899,050	£ 1,885,660	£ 2,027,036
Expenditure ..	£ 1,111,126	£ 1,086,126	£ 1,054,177
Operating ratio per cent.	58·51	57·59	52·01
Revenue from passengers £	178,460	198,606	195,049
Revenue from goods £	1,570,156	1,545,632	1,688,434
No. of passengers ..	2,377,938	5,179,206	5,080,016
Goods tonnage ..	646,054	627,475	660,615
Average receipt per passenger ..	1s. 6d.	9d.	9d.
Average receipt per ton ..	49s. 11d.	50s. 6d.	52s. 2d.

As will be seen there was a rise in the goods tonnage and revenue this year, which was accompanied by an increase in the average length of haul from 356 miles to 365 miles, thus indicating that the improvement in trade was largely in respect of the long haul traffic. Actually the groundnuts traffic, which arises in the far north, shows the largest increase, the tonnage rising from 205,965 tons to 219,874 tons. There was also an increase in the shorter hauled cocoa and palm kernel traffic which is subjected to severe motor competition. The output of tin, which is another traffic with a haul of some 550 miles, also shows an increase. Passenger traffic remained more or less stationary. In 1933, the fares were reduced to a 4d. a mile third class, and this resulted in the traffic for the year 1933/34 more than doubling itself in comparison with 1932/33. This level of the number of passengers has been nearly maintained. The average miles per passenger remained stationary at 29.

The operating ratio improved from 57·59 per cent. to 52·01 per cent. and the net receipts equalled a return of 4·21 per cent. on the capital compared with 3·46 per cent. for the previous year which can undoubtedly be considered a most satisfactory result, although, as in previous years, no contributions were made to renewals. In this connection the General Manager remarks: "No provision for renewals has been possible since 1929. The balance then in the railway renewals fund is not yet exhausted. It has recently been augmented by Government for future needs. The money is being carefully laid out on necessities." Actually, taking into account arrears of interest, there was a deficit in the year's working of £74,314, but the railway received no part of its capital free of interest or subsequent repayment and has been charged with interest on every pound spent since its inception. The report contains various observations on the subject of competition, but the position of the Government in a country like Nigeria is admittedly difficult because motor transport is largely run by native enterprise and as such the Government must be loth to restrict it.

Train loading has been re-scheduled after experimental runs when time-load-speed charts were plotted. The General Manager remarks that under previous arrange-

ments locomotives were inclined to be overloaded and that this necessitated continuous working with long cut-offs causing failures through shortage of steam, and he hopes that improved operating will result from revised timings and train loadings. A programme of bridge strengthening is being carried out. In connection with programmes for new engines, a supply of Nigerian coal was sent to the Department of Scientific and Industrial Research for a test and for recommendations with regard to locomotive firebox design. The appointment of a Research Assistant to the Chief Mechanical Engineer mentioned in a previous report has proved of considerable value. Some of the matters dealt with are: Waxing of coaching stock; valve gear experiments; oil consumption; fire-bar spacing.

The preparation of statistics has been overhauled, and mechanical appliances introduced. The railway runs a road motor feeder service which does good work in opening up areas. Many of the lorries have been re-powered with diesel engines. An interesting paragraph in the report deals with welfare and incentive. This is a very important matter in dealing with native staff and the General Manager's remarks are as follows:

The welfare of the railway staff is constantly under review. In the interests of both railway and staff the principle of promotion and of incremental increases in salary "by merit" is being insisted upon. At the same time, effort is being made to interest the staff in the railway, not merely as a means of livelihood but as a powerful and widespread organisation for public service within which there is ample scope for individual development. Towards this end it is proposed to extend the scope of the Monthly Bulletin to include items of general railway interest. Mutual improvement arrangements at out-stations are also being encouraged and are meeting with success. The institution of an African staff technical library at Ebute Metta is under consideration. Numerous contributions to staff sports clubs have been made from the fund allocated to that purpose.

The policy in all our Overseas possessions is to employ as many natives as possible and that part of the report which deals with this question will probably be of interest to railway administrations elsewhere. The policy of replacing Europeans by Africans has, of course, to be accompanied by really sound methods of training, and there is evidence in the report that so far as the Nigerian Railway is concerned, this is on an adequate scale.

The business part of the City of Lagos, the capital of Nigeria, is situated on an island in the Lagos Lagoon connected to the mainland by a road bridge. The terminus of the railway is on the mainland, and in order to improve contact with the public the General Manager has opened an office in the main part of the city. A very serious wash-away occurred at Zungeru which resulted in the main line from Lagos to the north being closed for three weeks. Alternative arrangements were made with the shipping companies to divert the traffic via Port Harcourt. An interesting feature disclosed in the report is combined road rail booking between the east and west main lines, that is to say a connecting link is provided by road transport between the main line running from Lagos and the main line running from Port Harcourt. Considerable work has been carried out in the main locomotive carriage and wagon workshops at Lagos; four locomotives have been rebuilt, as well as numerous carriages and wagons. The stock of engines was reduced by 14 and the miles per day per engine in use was 85, the same as last year. In view of the heavy grades and therefore comparatively slow speeds, this figure is undoubtedly a satisfactory one. The Nigerian Railway operates the handling of traffic at the rail-connected quays and wharves at Lagos and Port Harcourt. The total tonnages dealt with were: 1933/34, 525,474; 1934/35, 585,958. The Nigerian Railway is responsible for the operation of the large colliery at Enugu. The output of coal rose from 234,296 tons in 1933/34 to 258,892 tons in 1934/35.

The Railways and Ribbon Development

THE Restriction of Ribbon Development Act, 1935, made it illegal as from August 2, 1935, to construct, form, or lay out any means of access to or from any classified road which was a classified road on May 17, 1935, or to erect or make any building within 220 ft. from the middle of such road without the consent of the highway authority. This Act also gave highway authorities power to apply the same restrictions to any highway maintained at public expense by means of a resolution approved by the Minister of Transport, whose duty it is to take into account any objections to the proposal made by interested parties. Further, it enabled highway authorities, again by resolution approved by the Minister, to adopt certain specified standard widths for any highways maintained at public expense, classified or unclassified, within their areas. These standard widths are scheduled to the Act; they are 60 ft., 80 ft., 100 ft., 120 ft., 140 ft., and 160 ft. The effect of the adoption of a standard width for any road is to make it illegal to form or lay out any means of access to or from the road, or to erect or make any building or permanent excavation, or to construct, form or lay out any works upon land nearer to the middle of the road than a distance equal to one-half the standard width adopted for the road in question without the consent of the highway authority. It seems that a railway company is in the same position as any other owner of land in respect of property held or used for residential development or commercial purposes other than railway purposes. No restrictions made under the Act are however to apply, without the railway company's consent, to any land held for the purpose of the company's undertaking. Consent where required by the highway authority, as where railway land is affected, may not be unreasonably withheld, and the final decision whether consent is being withheld unreasonably is made by the Minister of Transport, although he must consult any other government department concerned before giving a decision. Where land held for railway purposes adjoins the highway and separates from it other land held for other purposes, a railway company cannot take advantage of the saving in its favour to secure for the back land the advantages of purely railway land: in such a case the restrictions will apply to the making of any access across the railway land for the benefit of the other land. There are, however, certain other rights and duties of a railway company which are definitely exempt from interference; these are rights to erect any support, or make any excavation for the purpose of laying, making, altering, repairing, or renewing any main, pipe, sluice, weir, electric line, duct, drain or other apparatus.

In addition to the power to apply restrictions to land along highways, the new Act enables highway authorities to acquire by agreement or compulsorily any land within 220 yd. from the middle of any highway maintained at public expense. Land may be acquired under this provision for the purposes of road construction or improvement or for preventing the erection of buildings detrimental to the view from the road. Also, but by agreement only, a highway authority can acquire land for the preservation of local amenities. Land cannot be acquired compulsorily which is held by a railway company for the purpose of the undertaking, however, unless it gives its consent, but here again the withholding of consent must be reasonable and the Minister of Transport, after consultation with any other government department concerned, is the final arbiter. With regard to other land not held for the purposes of the railway, a company is again apparently in the same position as any other landowner: land which comes within this category cannot however be acquired

compulsorily under the new Act, except for road construction or improvement, if it is required to be retained as part of a park, garden, pleasure ground, or home farm attached to and usually occupied with a mansion house or is otherwise required for the amenity or convenience of any dwelling house existing when the order for compulsory purchase is made or is subject to one of the special agreements as to development which can now be made under the Town and Country Planning Act, 1932. In arriving at the price to be paid to the landowner for land and compensation, allowance is to be made for any benefit to adjoining land of the same owner due to the improvement for which the land is taken, and for any undertaking given by the highway authority as to the future use of the land.

Although the new Act does not give highway authorities general power to restrict railway lands or to acquire them by compulsory purchase order, it does give them power to acquire compulsorily rights over or under a railway company's land held for the purpose of its undertaking. These rights, or easements, are for various purposes, namely the construction of any bridge, but definitely not for the reconstruction or alteration of an existing bridge, upon, under, or over the company's land, or of the approaches to such bridge or for the purposes of any system of road drainage. Easements for these purposes can be secured by a compulsory purchase order approved by the Minister of Transport after consulting the railway company affected. The highway authority is to be liable, except as otherwise agreed, for the future maintenance of the bridge or drainage system, and for any additional expense involved in widening the railway over or under a bridge on land owned by the company at the time of the confirmation of the compulsory purchase order. In making the order the Minister is to impose such conditions as seem necessary after consulting the highway authority and the company for securing that the new bridge or drainage system will be so designed as to avoid unreasonable interference with the functions and future development of the company. Road drainage is not to discharge into any reservoir, river, canal, dock, harbour, basin, or other work belonging to the company. The new Act also contains special provisions as to the substitution of bridges for level crossings. These involve modification of certain sections of the Bridges Act, 1929, and the position under the new Act is set out in one of the schedules. The changes concern apportionment of costs and provision for arbitration where disputes have arisen between highway authorities and railway companies.

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Japanese Government Railways

THE railway traffics of any country are a valuable index as to the state of trade generally, and nowhere more so than in Japan, where the great activities on the railways reflect the rapid expansion of business following upon the Manchurian incident of 1931 and the subsequent activities on the Asiatic mainland, together with the virtual subsidisation of the main export industries without recovering the money by immediate taxation. Since 1931 the business and profit of the Japanese Government Railways has increased to an extent which must create a certain amount of envy among most other railways administrations throughout the world. The receipts for the fiscal year 1934-35 were higher than in any previous period, except the peak year 1928-29, and are now within 2 per cent. of the figures for that year, although the working expenses are 4 per cent. higher.

Compared with 1933-34 the working receipts for the year ending March 31, 1935, increased by 10 per cent.,

but the working expenses rose by 11·2 per cent., and the operating ratio was 60·6 compared with 59·6. The interest and subsidiary capital charges amounted to 103,645,226 yen, and, added to the operating expenses, gave a total expenditure of 417,771,343 yen. The remaining net surplus of 100,896,730 yen represented a return of 2·65 per cent. on the capital invested, viz., 3,813,211,445 yen. The operating results are compared in the following table (the yen is now about 17½ to the £1):—

	1934-35	1933-34
Passengers carried (millions) ..	913·56	841·31
Tonnes of goods (millions) ..	77·47	71·97
Passenger train km. (millions) ..	158·5	147·9
Goods train km. (millions) ..	62·9	57·0
	Yen	Yen
Capital invested ..	3,813,211,445	3,682,426,398
Passenger receipts ..	238,681,479	222,247,143
Total coaching receipts ..	274,096,342	254,533,956
Goods receipts ..	215,615,301	195,183,483
Total operating receipts ..	518,668,073	473,570,962
Working expenditure ..	314,126,117	282,199,614
Operating profit ..	204,541,956	191,371,348
Net profit after meeting capital charges ..	100,896,730	88,675,275

The passenger traffic increased by 8·8 per cent., but the increment in passenger revenue was only 7·5 per cent., although the average journey of each passenger remained the same at 24·7 km. On the other hand, the goods traffic increased by 7·3 per cent. and the goods revenue by 10·3 per cent. The length of line open to traffic increased by no fewer than 690 route km. to 16,427 km.; the total track km. is now 26,520. The steam locomotive stock decreased by 102 to 3,811, but the number of electric locomotives increased from 141 to 165 and the electric motor-coaches from 1,375 to 1,403. An increase of 1,681 was made in the number of coaching vehicles to a total of 9,416, and the goods stock rose from 65,804 to 67,485 wagons. As usual, a profit was made on the shipping between the various islands, the receipts totalling 13,321,046 yen, an increase of 14·7 per cent., and the expenses 6,300,608 yen, an increase of 12 per cent. The working expenditure of the whole railway organisation was made up as follows (in percentages): general expenses, 1·9; maintenance of way, 17·5; electric traction, 4·1; maintenance of rolling stock, 9·9; transportation, 25·0; traffic, 33·7; road services, 0·5; shipping, 2·0; subsidies and relief associations, 1·5; health and welfare, 1·95; and miscellaneous (including the annual allowance of 27,440 yen for secret service), 1·95.

* * * *

The Indo-Iranian Railway

THE enterprise with which the present Government of Iran (Persia) has come to be associated, is once more evinced by the visit of Mirza Seyyid Kazami, the Iranian Minister, to India. He was due to arrive in Delhi yesterday, and, according to *The Times*, one of the principal objects of his visit is to discuss the furtherance of Indo-Iranian trade by the re-opening—and possibly also by the extension—of the Nok Kundi-Duzdap section of the Indian North Western Railway. This—as may be seen from the map on page 888—is the most westerly section of that long tentacle of the Indian railway system which stretches some 400 odd miles westwards from Quetta and terminates on Iranian soil at Duzdap or Zahidan. Due to lack of traffic the last 150 miles from Nok Kundi to Duzdap were closed in 1932, but the track is still in position and could probably be put in order at very slight cost. The history of this line is of some interest. The first 70 miles from Spezand junction, near Quetta, to Nushki were built early this century and the remaining 350 miles to Duzdap (Zahidan) were constructed—the earlier sections with great rapidity—as a war measure. The East Persian Cordon, a

joint Anglo-Russian force, policed the whole belt of country from the Caspian Sea to the Persian Gulf, the British portion of the beat being from Birjand southwards. Birjand is about 700 miles from Quetta, and this abnormally long line of communications was maintained by camel transport until, in 1916, thousands of camels were wiped out by disease. It was thereupon decided to construct the railway, which was then known as the Nushki-Seistan extension, as the Seistan oasis some 80 miles beyond Duzdap was its original objective.

The survey and construction of this line had several abnormal conditions with which to contend. Apart from the fact that practically the whole country traversed was waterless *dash* or stony desert, with no animal or vegetable life, such phenomena as marching sandhills and rivers running along crests of ridges, instead of in the valleys between them, had to be circumvented. These sandhills known as *do-reg* move in lines right across the country, driven before the prevailing wind. They are of an elongated horse-shoe shape in plan, and they move at perhaps 200 ft. a year. This 120-days' wind, as it is called—it actually blows practically continuously for nearer 200 days of the year—carries with it a coarse sand which cuts the flesh and must be very severe upon locomotive motion, &c. For long distances the line runs parallel to the hills along the Afghan frontier to the north, and has to cross the beds of what are mountain torrents debouching from those hills when there is any rain, as there is occasionally. Each of these streams has formed a great conical boulder-strewn *glacis*, fan-shaped in plan, along the crest of which it flows when in spate, and hence the switchback formation in section. These streams had to be diverted into the intervening valleys, and the line crosses them by means of "dips," or Irish bridges approached on each side by steep momentum grades. The spates are normally of such short duration that light traffic is not seriously interrupted due to the Irish bridges being under water.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Railways and Land Values

National Liberal Club, S.W.1.

November 17

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Referring to Mr. K. H. Johnston's letter and your footnote, it surely is not necessary for the railways to purchase the land of a district where a new line is projected in order to get the increased land values which will surely result in the whole neighbourhood. All that is needed is a change in the present basis of rating. Let present rates on houses and improvements of every kind, including railways, be abolished and replaced by a rate on the bare land value. The railways will then get their just share of the land values they help to create and will be correspondingly relieved from the heavy burden of rates and taxes they now carry.

W. R. LESTER

CINEMA ON WHEELS.—Tomorrow, November 23, in the Pathé cinema van which is in service on the L.N.E.R. express trains between King's Cross and Leeds, the thousandth performance will be given since this novel feature was first introduced in June of this year. In the intervening period the van has travelled 63,300 miles in its journeys between Leeds and London, and the performances, which are similar to those given in a news theatre, will have been witnessed by over 16,000 people. On page 882 we reproduce a photograph showing the interior of the cinema van.

PUBLICATIONS RECEIVED

Journal of the Institution of Civil Engineers.—As from November 15, the papers read to the Institution of Civil Engineers, and other matters pertaining to the institution which formerly appeared in the *Transactions and Minutes of Proceedings*, are being published in a journal having eight issues yearly. The dates of publication are the fifteenth of November, December, January, February, March, April, June, and October, making six issues during the session of the institution and two in the recess. In the first number, 147 pages, with illustrations and diagrams, are devoted to articles and papers, among the latter being Mr. H. D. Bindley's contribution on "Sudan Railways, 1925-35." The concluding section of the journal gives general notices, and abstracts of papers to be discussed during the currency of the issue.

Garcke's Manual of Electrical Undertakings and Directory of Officials. Edited by Frederick C. Garrett. London : Electrical Press Limited, 13-16, Fisher Street, W.C.1. 8½ in. × 5½ in. × 3½ in. 2,143 pp. and 16 map supplements. Price 37s. 6d. net.—The present volume, which is the 38th annual edition of this invaluable reference work, has appeared once again in the familiar style and arrangement of such proved convenience. It provides in four classified sections a complete record, including information as to statutory powers, areas of operation, general history and progress, equipment, administration, finance, output, profits, &c., of all electricity supply undertakings in the United Kingdom and throughout the British Empire, and of all electrified railways, tramways, and trolleybus systems, telegraphs and telephones, electrical manufacturing companies, investment trusts, and allied concerns. Over 5,000 undertakings are dealt with and the whole of the data is derived from reliable sources and the latest authentic information obtainable up to the time of going to press; an addenda section provides summaries of new accounts received while the volume was being printed.

The important data first published in last year's edition, showing in respect of each undertaking the extent of the authorised area (in acres), the population, number of premises in area, and the rateable value, has been widely welcomed as a valuable new feature, and, in common with the whole of the contents of the manual, has been exhaustively revised and brought up to date. In the general survey section the whole of the financial and technical data available in respect of the undertakings described are collated, analysed and tabulated for comparison—year by year, providing an epitome of the history and progress of the industry since 1896. The section also provides information concerning new Parlia-

mentary powers; electricity special orders; tramway, trolleybus, and light railway orders; and reports of government departments, departmental committees, and other official bodies connected with the electrical industry.

This year, in response to numerous requests, the publishers have re-introduced the contractors' section, giving the names and addresses, arranged under towns, of over 6,000 electrical contractors including those on the National Register and members of the Electrical Contractors Association. The section serves the further useful purpose of providing an index to the towns and principal villages where electricity supply is available, giving the name of the supply undertaking, the voltage of supply, the contracting, hire, and hire-purchase facilities offered by the supply authority, and information regarding showrooms and service facilities, together with the address and the name of the showroom manager or consumers' engineer.

In addition to its four sections of technical, financial, and commercial information, and the general survey section, Garcke's Manual contains a directory section giving the names, addresses, and appointments of about 17,000 directors, secretaries, engineers and managers, and other company and municipal officials engaged in the industry, including all members and associate members of the I.E.E.; and an exclusive list of members of municipal supply and transport committees.

A Yearbook of Railroad Information.—The 1935 edition of this useful 96-page booklet has just been issued by the Committee on Public Relations of the Eastern Railroads, New York, for free distribution to interested persons. Its purpose, like that of its predecessors, is to make readily available a mass of statistical and other data regarding the railroads of the U.S.A. It is divided into seven main sections, namely, plant, service, rates, earnings, purchase, employees, and operations, while an index further assists in enabling facts to be traced easily. For example, a table showing "old and obsolete equipment retired" is probably not the first place to look for the abandoned mileage figures, but the index puts the searcher immediately on the track. Incidentally, when he has found it he sees that the year 1934 saw no fewer than 1,995 route miles abandoned—the largest figure yet in one year. We understand that copies will be supplied on request to the Committee on Public Relations of the Eastern Railroads, 143, Liberty Street, New York.

Heat-Resisting Steels.—Shadrach, Meshach, and Abednego are the names appropriately applied to three grades of heat-resisting steels produced by Head, Wrightson & Co. Ltd., of Teesdale Iron Works, Thornaby-on-Tees. The company has been developing this

special branch of alloy steels for the past seven years, and has now published an illustrated booklet dealing with these metals and their applications. Shadrach and Meshach steels withstand temperatures up to 1,100° C. without scaling, and can be used in sulphurous atmospheres without corrosion. Abednego steel is more ductile at low temperatures than the foregoing, and has been specially developed for use where continuous heating prevails over very long periods. For this reason it has been widely adopted as a material for locomotive firedoors. All three qualities are recommended for parts of mechanical stokers which are subjected to the heat of the furnace.

Wiring Systems.—This catalogue of G.E.C. wiring systems, using Pirelli General wires and cables, is published by the General Electric Co. Ltd., Magnet House, Kingsway, W.C.2. The types of wiring listed are lead-covered, watertight, and rubber sheathed, and a comprehensive range of junction boxes, connectors, clips, switches, plugs and electric light fittings is shown. Every requirement for normal domestic and office electrical installations is listed in the catalogue, including mains switches of the well-known Ironclad type, and fuse boards.

Winter Resorts.—A novel feature of this publication of the Great Western Railway is a section of notes, largely taken from the "Medical Directory Guide to British Health Resorts," dealing with the curative properties of seaside and inland centres served by the company. The major part of the booklet is a survey of Great Western winter resorts by Mr. Maxwell Fraser, F.R.G.S., entitled "Winter in the West," in which some convincing arguments are put forward in favour of wintering at home instead of on the Continent. These pages are copiously illustrated with full and half-page views.

Ventilating Louvres.—The Punkah louvre is a ventilator designed on the principle that the most efficient cooling of the atmosphere in a room or hall is secured when fresh air from fans is admitted through small orifices at high velocities. In these circumstances it is necessary for the direction of the air stream to be controllable in order to avoid discomfort, and this requirement, as well as a closed position, is provided in the various types of Punkah louvre. They are described in a new illustrated catalogue from Thermotank Limited, Govan, Glasgow, wherein their application to ships, aircraft, and railway rolling stock is shown. Combined regulation of air direction and temperature is simply afforded by Thermo-Reg louvres, and two illustrations from THE RAILWAY GAZETTE show these louvres and supply fans installed in the latest sleeping cars of the L.N.E.R. Other systems using Thermotank ventilating methods and equipment are the L.M.S.R., the G.W.R., the Siam State Railways, and the Canadian National Railways.

November 22, 1935

THE SCRAP HEAP

The L.M.S.R. has re-stocked the Shropshire Union Canal at Tattonhall Road (Cheshire) with 4,000 fish including dace, roach, perch, and rudd. This section of the canal is much in favour for North-Country angling competitions.

* * *

The L.N.E.R., says a news item, has decided to paint 354 passenger stations and depots during 1936. I understand that the L.M.S., not to be outdone, has given orders to have all its railway station buns reglazed.—*From "The Morning Post."*

* * *

A note of pathos was struck in some of the journals relating to the running of Southern Railway passenger trains on September 28, as the following extracts, quoted from the *Southern Railway Magazine*, show:—

10.33 a.m. Cardiff to Portsmouth.—Guard A. King, of Portsmouth, remarked "This is the last journal to be submitted to you by me; so good-bye. All signals off." (It is hoped that Mr. King, who celebrated the occasion by arriving at Portsmouth six minutes before the booked time, will continue to have a clear run of health and happiness.

10.15 p.m. Ringwood to Bournemouth Central.—Guard Tupper, of Bournemouth Central, endorsed his journal "Several passengers made a special trip for the last time, in view of the closing down of the branch line. I am sorry this is the last journal after 30 years of trips across this line." (As a matter of fact, this was not the final service, as on the following Saturday a special was run with two camping coaches, with passengers, from Hurn to Christchurch.)

* * *

BULLS ESCAPE AND CHARGE CROWD
An ex-Lord Mayor of Bristol, Alderman T. J. Wise, came to the assistance of the Great Western Railway Company today (November 19). He shot a young store bull which had been at large for hours on the line in the main station at Temple Meads, Bristol. Three young bulls, which had escaped from a siding, came charging down the line by one of the main platforms. Crowds of men stopped work and tried to capture them. Traffic was held up. One bull came running down the platform. People climbed signal ladders to get out of the way. The bull charged down the line as an engine came along. In spite of shouts and cries, it continued on its way. The engine driver, in response to signals, pulled up just as they met. A hose was turned on another bull, but it simply charged through the crowd, knocking over several men. A third bull went down the line to Bedminster station, where it was cornered in a subway. Three ropes were stretched across the subway, but the bull jumped over them and ran back down the railway track to Temple Meads. One bull was eventually captured, but two had to be shot.

—*From "The Evening Standard."*

* * *

ITALIAN IS A SOFT LANGUAGE
A despondent cow apparently attempted suicide by lying down on the New York Central tracks near Troy, New York. Four policemen, summoned to the scene, vainly tried to move her with shoves, halters, tow-ropes, and words both kind and harsh. Finally the owner, Rachel Camorata, arrived, addressed the cow in soothing Italian, and the animal sighed, rose and was led away.—*From the "Railway Age."*

* * *

One of the largest sundials in the world is laid out in the station park of the Santa Fe Railroad at Dodge City, Kansas. The "face" of the sundial is some 30 ft. in diameter. The time indications are whitewashed stones set in the grass, and the pole which casts the shadow is 15 ft. high.

* * *

TREASURE!

According to *The Journal*, of Perry, Michigan, the old Junction House in Durand, famous as a hostelry in the early railroading days and abandoned ten years ago, is now being razed. The structure was erected in 1876, the year in which the Grand Trunk Railroad was extended from Lansing to Flint. Mr. W. A. Darling, of Perry, who recently purchased the structure, expects to salvage 30,000 feet of good lumber. The tearing out of walls has already yielded a quart of whiskey which had been secreted in the building 50 years ago, while another find was a railroad map dated 1873.

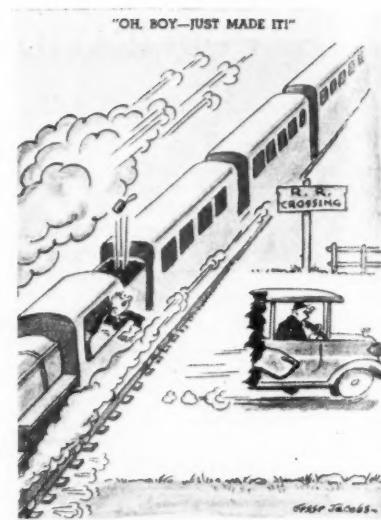
* * *

International difficulties are the subject of many press dispatches, but we have as yet failed to see any mention of the intricacies of operating through trains between Norway and Sweden. The Swedes follow the British left-handed operation, both for road and rail vehicles, while their Norwegian neighbours drive to the right. By way of assuring that the engine crew is aware of the changed conditions, as well as for the information of passengers, the rules require a whistle signal when 650 ft. from the frontier, and another just as the locomotive crosses the international boundary.—*From "The Mutual Magazine."*

* * *

THE ANNOUNCER'S SPECIAL

Mr. Stuart Hibberd, Chief Announcer of the B.B.C., told me a story yesterday which may be a tribute to the B.B.C. or to his persuasive voice. He and five other passengers found after midnight that they had missed the last train from Charing Cross to Chislehurst, which had left without warning from a new platform. The marooned six went gloomily to London Bridge. There Mr. Hibberd interviewed the station authorities, and mentioned that he had



A striking cartoon which has been reproduced in many U.S.A. papers

just come off duty at Broadcasting House. Presently a special train consisting of three coaches pulled into the station and carried the six passengers the 12 miles to Chislehurst. For this purpose the whole line was kept electrified for half an hour.—*From "The Daily Telegraph."*

* * *

FRENCH RAILWAYS

The following notes are extracted from "The Railway Magazine" of November, 1835:—

The *Moniteur* says that four inquiries have been ordered to be made by the Government as to four railways, namely, (1) from Paris to Tours; (2) from Paris to Orleans; (3) from Paris to Rouen and Havre; (4) from Paris to Tours by Versailles and Chartres.

PARIS AND HAVRE RAILWAY.—A project for a new railway from Paris to Havre, with a branch to the canal of La Villette to St. Lazare, La Madeline, and Tivoli, St. Denis Pontoise, Beauvois, Gisors, Rouen, and Havre, has been presented to the Government by M. Desfontaine, principal engineer. It is about to be considered, and will probably be shortly carried into effect.

PARIS AND ST. GERMAIN'S RAILWAY.—It is said that four bankers, Messrs. Davilliers & Company, Messrs. Louis d'Eichtal & Son, Messrs. Thurneyssen & Company, and Messrs. Rothschilds Brothers, with M. Pereire, have formed a private society for carrying into effect the railway from Paris to St. Germain's. The funds raised for this purpose are said to amount to five millions of francs, to be divided into 10,000 shares of 500 each. M. Pereire will be the acting director, and three engineers of first-rate talent are to be engaged to superintend the works.—*Globe, October 15.*

OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

SOUTH AFRICA

Financial Position

The results of working for the five months April to August show a surplus of £1,002,012 of revenue over expenditure after allowing for special appropriations of £333,333 to betterment fund, £202,917 deficiency in pension and superannuation funds, £416,667 rates equalisation fund and £166,666 to writing out of capital account discount and expenses on pre-Union capital. Revenue from transportation services only for the period totalled £11,914,506, an increase of £1,130,049 on the previous year. Railway working expenditure totalled £7,849,203, an increase of £408,529 on the previous year.

A new record in earnings was created in the week ended October 10 when the total reached £610,732. This is the first time in the history of the railways that £600,000 has been reached. The principal increase was in goods traffic, which totalled £415,164 as compared with £330,088 in the corresponding week of the previous year.

Opening of the Springs-Nigel Line

The new Springs-Nigel line—briefly described in THE RAILWAY GAZETTE of March 15 last—was officially opened on October 18 by Mr. A. Kuit, Chief Railway Commissioner. The line is twenty miles in length and the cost of construction was £164,000. It serves the rapidly developing mining district of the Far East Rand. On the route there are four great producing mines and several potential developing mines. Eight new residential townships have been established within the area in the past two years. Following the administration's policy, white labour was utilised largely on the construction, 1,147 men being employed, who received £47,000 in wages, averaging over 8s. a day.

ARGENTINA

Santa Fé Provincial Terminus

According to a press report, proposals will shortly be submitted to the National Government by the administration of the Santa Fé Provincial Railway—one of the three French companies in Argentina—for the transfer of the terminus in the City of Santa Fé to a more convenient site than the present one, which is described as cramped and lacking in the facilities for expansion which present-day requirements demand. The plans and technical studies of the scheme, although not yet completed, are said to be well advanced and will, it is stated, be submitted to the Government for approval before the end of October. The cost of the work is

estimated at \$17,000,000 paper. The new site at first proposed was near the terminus of the Argentine Central North (State) Railway, but it is now proposed to build the new station in the Juan de Garay Park on the west side of the city.

Railway Material for Port Works

A decree issued by the Ministry of Public Works on October 4 authorises the Director-General of Navigation and Ports to spend approximately \$15,000,000 paper on the purchase of permanent way. Of this sum, about \$12,826,000 will be for new track within the zone of the New Port at Buenos Aires, the balance, of about \$2,000,000 paper, being for the improvement of communications with the Old Port so as to replace the existing Northern junction. The entire sum is included in the total cost of the New Port works, estimated at \$150,000,000 paper.

Another decree issued by the Ministry of Public Works authorises the same department to expend the sum of \$2,506,687 paper on the construction of an oil pipe line in the port of Comodoro Rivadavia—the site of the national oilfields in the territory of Chubut—on the extension of the breakwater, and on the carrying out of a number of subsidiary works in order to improve the present loading facilities; this is in addition to the sum of \$292,319 paper for renewals to the railway lines in the same port.

INDIA

Production from Railway Collieries

Discussing the deliberate reduction in the output of coal from railway collieries for the purpose of assisting the coal industry, the Public Accounts Committee recently observed that railway finances were made instruments of Government policy towards certain industries, with the result that burdens which should be borne by the taxpayers were thrown upon the railways. Full exploitation of railway collieries would enable railways to obtain coal at least as cheaply as in the open market. The loss of about Rs. 12 lakhs on the working of railway collieries, which a reduced output involved, could thus be avoided.

Colliery owners are perturbed over the foregoing remarks of the Public Accounts Committee, and a representative deputation is now at Delhi for the purpose of pointing out to Sir Zafrulla Khan, Honourable Member for Railways and Commerce, the grave consequences to the coal industry which will follow upon any great reduction in the consumption of public coal by the railways. Other disabilities of the industry will also be mentioned. The

railways are now in the market for coal, and it is possible that the deputation will urge the authorities to come to a quick decision on the tenders, as the long delay in previous years in the distribution of orders has been a great handicap to unsuccessful tenderers.

Megna Bridge

In a letter to the Railway Board, the Committee of the Bengal Chamber of Commerce expresses the view that the construction of a railway bridge over the River Megna between Bharab and Ashanganj stations on the Assam Bengal Railway at a cost of Rs. 60 lakhs is not desirable at a time when low railway earnings and stringency of finance necessitate curtailment of expenditure. For the committee agrees with the Narayanganj Chamber of Commerce and jute interests generally that the existing wagon ferry operating twice each way daily, satisfactorily copes with all existing traffic. Acceleration of transport, which appears to be the only advantage of the proposed bridge, does not, they consider, justify the heavy expenditure involved in its construction.

New Railways

The Government of India has sanctioned the construction by the Railway Department of the Mysore Government of a metre gauge railway from Anandapuram to Sagar, a distance of 16·22 miles. The construction of this railway will be a notable advance towards the scheme for building a modern port at Bhatkal on the West Coast.

The Gondal Darbar (Kathiarwar) will build a metre gauge railway from Kunkavav to Bagasara at a cost of about Rs. 5 lakhs. The new railway will open up an untapped area.

The Diwan of Cochin has under examination a scheme for the construction of a metre gauge railway from Trichur to Kollengode. Along with this project he will consider a proposal for having a metre gauge connection between Trichur and Ernakulam alongside the broad gauge railway.

BRAZIL

Leopoldina Railway: Extension of Rail-and-Road Transport Scheme

With the opening, as far as Friburgo, of the highway known as the Rio-Bahia road, the Leopoldina Railway has already been deprived, through competition, of a considerable quantity of goods and parcels traffic, and, with a view to re-capturing a portion of this lost revenue and lessening the danger of continued diversion, has drawn up a further agreement with Augusto Filpo & Cia., the firm with which the railway contracted in August, 1933, for rail-and-road haulage between Rio and Petropolis.

By this agreement Sr. Filpo undertakes to collect, within the urban zones of Rio and Friburgo, a minimum of 50 tons of traffic a month, handing it

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over to the railway for haulage between these places and delivering it at both ends within the urban zones. A flat rate of 100 reis per kg. (equivalent to 100 milreis a ton) has been fixed for the railway portion of the service—a rate which is slightly above the average charge made by road-hauliers, but which, in view of the distance (150 km.) and the fact that "incline" working is involved, could not very well be made lower; Snr. Filpo's proportion of the receipts is 35 milreis a ton.

It is hoped that if, as is generally expected, the stipulated minimum of 50 tons a month is exceeded, an effective response will be made to the railway's competitors, who are allowed unrestricted use of the road, can quote any rates they please and, although bound by decree to pay transit taxes and other dues, almost invariably succeed by a process of collusion in evading these obligations.

Centenary General Transport Congress

In connection with this congress, which is being held in Porto Alegre this month to celebrate the centenary of the first Act passed by the Government for the establishment of rail transport in Brazil, five separate commissions have been appointed to discuss water, rail, road and air services, and also transport co-ordination. The agenda of the railway commission will include the following subjects:—

Technical Section.

(a) Standardisation of rolling-stock; maximum loading gauge for through traffic; minimum loading gauge on track.

(b) Relation between vehicle and track, having in view the maintenance of safety at high speeds.

(c) Locomotives and railcars; utilisation of new types and systems, bearing in mind condition of line and areas served.

(d) Electrification of railways from the economic standpoint.

(e) National fuels.

Inter-State Rail Co-ordination Section.

(a) Organisation and efficiency of passenger and goods services; tourism.

(b) Utilisation and choice of transhipping equipment.

(c) Agreements for through traffic.

Railway Legislation Section.

* Regulations concerning safety in railway operation; reduction of accidents; insurance and provident schemes.

Economic and Financial Organisation Section.

(a) Economic, financial and social advantages of railway amalgamation.

(b) Establishment of renewal funds by using revenue from existing dues (imposts) or by creating new ones.

(c) Registers of railway companies' property.

Education, Propaganda and Statistical Section.

(a) Standardisation of administrative, statistical and accountancy departments.

(b) Rationalisation of duties of railway staff.

(c) Instruction for sons of railwaymen; medical and hospital assistance; co-operative societies.

The commission in charge of transport co-ordination will discuss the following:—

(a) Co-existence and parallelism of various means of transport; methods for eliminating or reducing competition.

(b) Administrative and technical measures for the co-ordination of transport.

(c) Establishment of a Central Clearing House for all means of transport.

FRANCE

Simplified System of Goods and Parcels Transport

A simplified system for the transport of goods at cheap rates, applicable to all parts of France, has now been introduced by the railways in continuation of their efforts to modernise their commercial methods, and so cope more effectively with road motor competition. The new system came into effect on November 1. It has quickly followed the reductions of passenger fares, which became general on October 1.

Zone Schedules

Goods tariff schedules, contained in a pamphlet of four pages, have been drawn up. The schedules are distributed gratuitously to the public. They divide goods into two categories: (1) parcels weighing up to 50 kg. (110 lb.), and (2) consignments of 51 to 1,000 kg. (2,200 lb.). Adoption of a zone plan makes it easy to ascertain the cost of transport. Instead of making laborious calculations to determine distances from one place to another in France and adding supplementary tariffs, taxes and various incidental expenses, the person consigning any quantity of goods up to 1,000 kg. need refer only to the schedules.

For parcels up to 50 kg., the Departmental zone system is applicable. To send a parcel from one Department of France to another, the cost will be the same for the same weight from any town or village to any other. The price to be paid is easily found by reference in the schedules to the Departments in which the respective localities are situated.

Three Speed Categories

All the complicated tariff schedules hitherto in use have been simplified and reduced to four series of rates applicable to ordinary parcels, foodstuffs, farm produce and express parcels. Another reform is the speeding up of transit. There are now three categories known as (1) *vitesse unique*, which embraces both the former *grande* and *petite vitesse* services; (2) *colis agricole*, limited to prepaid single parcels which must not exceed 40 kg. in weight; and (3) *colis express*, covering parcels sent by express train at any time of the night or day, Sundays included. All parcels are forwarded at a speed equivalent to that of the previous *grande vitesse*, and on arrival, they are delivered gratuitously to any address. Moreover, the parcels are collected free of charge from any railway parcels office in a large town, or on payment of a small supplementary charge from any address in any locality linked with the railway by an automobile or other service.

By a special agreement with the postal administration, the parcels service is extended to include all the rural postal omnibuses. Such facilities for collecting small parcels from any

locality in the country are expected to give a stimulus to the agricultural production of districts remote from the railways.

For consignments of goods weighing from 51 to 1,000 kg., the railways are also applying the zone principle of calculating the cost. Two tables are given, one indicating the zones and the other the price of transport. These prices include all accessory charges and taxes, thus simplifying the total costs and saving time and money. While the calculation of tariff charges for complete wagon loads still remains complicated, it is hoped to find a remedy at an early date. The Ministry of Public Works already has under consideration a solution for the case of transport of livestock. Other reforms are likely to be undertaken in order to complete the commercial reorganisation of the railways and recover some of the goods traffic now lost to the roads.

FINLAND

State Railway Results

The following sections of new line were opened in 1934:—

Rovaniemi-Kemijärvi,
Lappeenranta-Tainionkoski,
Niinisalo-Parkano,

and construction was continued on those between:—

Pori-Haapavesi,
Lappeenranta-Vuoksenniska,
Varkaus-Viinijärvi,
Vuoksenniska-Ellensvaara.

Work was begun on the section from Kontiomäki to Hyrynjärvi, 51 km. (31.7 miles), decided on August 23 last year. It is eventually to extend to Taivalkoski, another 110 km. (68.35 miles).

The staff employed amounted to 28,748 in 1934, against 29,785 in 1933. Receipts were 829.2 million Finnish marks against 730.5 million in the previous year. (Par of exchange is 193.23 FM to £1.) The three years, 1932, 1933, 1934 compare as follow:—

Receipts	Millions of Finnish marks		
	1934	1933	1932
Passenger traffic ...	213.4	198.8	196.4
Goods traffic ...	568.6	487.7	435.7
Other traffic receipts ...	9.3	8.1	8.2
Telegrams ...	0.3	0.3	0.3
Various receipts ...	21.6	20.3	20.9
Postal traffic ...	16.0	15.3	15.3
Total ...	829.2	730.5	675.8

Of traffic receipts 68.5 per cent. were from passenger and 25.7 per cent. from goods traffic. Working expenses rose from 655 to 673.8 million F. marks, or 2.87 per cent., and the operating coefficient was 81.2 against 90.25 in 1933 and 100.7 in 1932. Interest on capital is, however, not included in the above figures.

CHANGING THE SIGNALS IN FRANCE*

The new code now being introduced in stages

IN the article on French railway signalling which appeared in our issue of December 28, 1934, some details were given of the alterations to signals necessitated by the adoption of the new code of indications, officially approved by the Government on August 1, 1930. These alterations have been stated to affect no fewer than 70,000 signals, at an approximate cost of £500,000. As a result of the Lagny disaster, it was decided to accelerate the work of conversion, and to accompany it with a number of other improvements.

A change of such magnitude needed very careful planning to enable it to be carried out with the minimum of difficulty for the drivers. The somewhat involved code of indications peculiar to French signalling made it impossible to change all the signals in one day, as was done in Holland recently when green lights took the place of white for "proceed." In that case, however, it meant only changing all the spectacle glasses, leaving the signals otherwise the same in appearance. In France much more than this has to be done, as the diagram shows the old and new signals being there set out for comparison.

A study of the diagram shows that whereas some signals now showing two lights will show one in future, others showing one will be changed to show two, which is one reason why the alterations have to be made gradually. Another important point is that on some lines a yellow light meant "stop" (Signal No. 2), but in future means "caution." To prevent confusion, therefore, it is proposed to begin with those signals, which are in any case used only on sidings and subsidiary lines.

Making the Changes

The first step was to remove the yellow lights from all subsidiary stop signals and to replace them by violet, changing the painting of the discs at the same time and installing the lunar white light for "proceed." This work was completed by July 1, 1935, at latest, and somewhat earlier in joint stations. At present an ordinary white light is used to indicate "proceed" in the old signals. As this, especially with oil lamps, has some resemblance to yellow under certain atmospheric conditions, lunar white will be substituted in all signals by June, 1936.

To prevent confusion in connection with the single red light, which at present in Signal No. 3 means a deferred stop, and in its new meaning, "stop and proceed" (Signal No. 4), a yellow light will be added to all red discs in January, 1936, as at present anticipated. The green light will then be withdrawn from the semaphores three months later, in April, 1936. Should the first date be altered for any reason, the second will be altered a like amount, but the dates are to be the same for all the railways.

The next change, and one of great importance, will be to adopt yellow lights in all warning signals (Nos. 5, 6, 7) in place of green, on a given day in September, 1936, on all the lines. Previous to this the painting will be changed as much as possible so that there will, for a time, be signals with yellow coloured discs exhibiting green lights. The new signal, No. 8, which has no equivalent at present (except on the Nord, where the green disc is used in this sense) will be installed at junctions when the

direction indicators are being removed or altered. It is intended to use them in future only where absolutely necessary, and at most running junctions they will no longer be seen. At present there are several types. For two directions only a single fishtailed arm, painted violet, is often provided, which projects horizontally to the right or left of the post to indicate the route which is *not* open. Two lights appear, one white, the other violet, on a horizontal line, to correspond. Another type has similar

NAME	OLD SIGNALS		NEW SIGNALS		
	APPEARANCE BY DAY	LIGHTS	APPEARANCE BY DAY	LIGHTS	
ABSOLUTE STOP	1				
ABSOLUTE STOP (SIDINGS AND SUBSIDIARY LINES)	2				
DEFERRED STOP	3				
PERMISSIVE STOP (BLOCK SIGNAL)	4				
DISTANT OR REPEATER	5				
DISTANT FOR BLOCK SEMAPHORE (NORD ONLY)	6				
REDUCED SPEED	7				
REMINDER OF REDUCED SPEED	8				
AN ALTERNATIVE ABSOLUTE STOP SIGNAL (No. 1) MAY CONSIST OF A SEMAPHORE AND A CALLING-ON ARM, PARTICULARLY ON THE PL.M. THE CLEARING OF THE CALLING-ON ARM AND OBSCURING OF THE LOWER LIGHT CONVERTS THE ARRANGEMENT INTO A 'STOP AND PROCEED' (No. 2) SIGNAL					
<small>IN THE OLD SIGNALS ONE, OR TWO WHITE LIGHTS INDICATED 'PROCEED' IN THE NEW, ONE GREEN LIGHT WILL BE USED, EXCEPT FOR SIGNAL NO. 2 WHERE LUNAR WHITE WILL BE SHOWN</small>					

Diagram showing changes to be made in the running signals on the French railways

* According to the plan arranged for the P.O.-Midi Railway, published in the *P.O.-Midi Illustré*.

arms mounted one over the other, the top referring to the most left-hand route, with violet lights. An arm lowered shows a white light, or green, sometimes, for reduced speed. In the new system the arms will be painted white and show no light normally. One arm will be lowered for the first route from the left, two for the second, and so on, with a corresponding number of lunar white lights. As this arrangement necessitates no light when normal, it lends itself very easily to the use of light signal units, and it is the intention of the P.O.-Midi Railway to construct all new direction indicators in that way, as well as the new reduced speed reminder signals (No. 8), thus eliminating much mechanical apparatus otherwise required. The green light for "proceed" is to be introduced everywhere (except in signal No. 2) in December, 1936.

While these alterations are being made it will be necessary also to modify certain ground point indicators and subsidiary signals (known as *voyants* on the Midi section) used for purely local purposes in stations, to prevent aspects conflicting. Generally this will consist in eliminating

colours from them and making them white, with suitable shapes, or using white light units.

A particularly interesting feature of this work on the P.O.-Midi lines is the adoption of electric lighting for all signals on the main routes. This will enable the mechanism of the signals to be much simplified. Where combined signals occur it will be necessary in the case of oil lamps to instal a comparatively involved spectacle equipment in order to obtain the different night indications required by the new code. By using colour-light units and circuit closers any combination can be produced with ease, and there are no mechanical parts to get out of order. An excellent lamp unit has been designed for the purpose, containing a bulb rated at 0·8 to 1·0 watt for a 4-volt circuit, which will enable a 500 ampere-hour battery to provide for the continuous lighting of a signal for more than three months. Such a lamp is amply sufficient for night time, and by day can be cut out, if desired, as the mechanical signal is then sufficient. Calculations show that electric lighting will work out cheaper than oil, when everything is taken into account.

A NEW RADIAL DRILLING MACHINE

An all-electric general purpose tool

KITCHEN & WADE LIMITED has sent us some particulars of an interesting machine recently constructed by that firm for a well-known shipbuilding concern. The applications of such a tool (which we illustrate) to general engineering purposes, including the construction and repair of rolling stock, are almost un-

limited. It is an all-electric radial drilling machine mounted on a traverse bed, and is described as being of the latest motorised centralised control type, with every control brought to the lower part of the drilling saddle. There are thirty-six speeds ranging from 800 to 8½ r.p.m., and eight feed changes ranging from 36 to 150 c.p.i. The spindle is started, stopped, and reversed through a large friction clutch. Automatic hip motion is applied to the feed for depth drilling, and also finger-tip movements to the saddle and arm, incorporating the improved roller arrangements. Traverse motion on the bed in any direction is provided. All these are matters of control, and the machine itself embodies many important improvements and represents a real heavy duty tool.



New K. & W. radial drilling machine

A Portable Icing Plant

On page 882 we illustrate a small, portable plant used by railways and consignors in America for icing and re-icing van loads of green vegetables. It consists of an ice crusher, mounted on a motor lorry or ice wagon, which squirts the crushed snow-ice all round the interior of the van. The lorry moves rapidly from van to van, and the quartered blocks of ice are crushed on the ice wagon in about one second as used. A powerful blower forces the snow-ice through a 10-ft. 6 in. dia. hose, which has a patented cup-sprayer that spreads the ice evenly over the produce. This new method of spray icing makes it unnecessary to put any block ice in the end bunkers or compartments of the refrigerator vans. Elimination of these bunkers would provide about 4 ft. more space at each end. The high-speed blast forces out all warm air, and the cars are thus pre-cooled. The powdered ice sifts down between the crates and solidifies when the door is closed. The crusher may be driven either by a separate 20-h.p. petrol engine, a 15-h.p. electric motor, or by a power take-off from the lorry transmission.

NEW FIRST CLASS SLEEPING CARS, L.M.S.R.

Details of the apparatus and methods employed in the welded construction of the underframes and bogies

ON pages 305-311 of our issue dated August 23 there appeared an article in which the new first-class sleeping cars which are being built at the Wolverton works of the London Midland & Scottish Railway to the design of Mr. W. A. Stanier, Chief Mechanical Engineer, were illustrated and described. It was possible on that occasion to refer only briefly to the special methods used in the construction of the underframes and bogies, which do not, however, depart from standard so far that standard brakework, springing and other equipment cannot be used. From the illustration of the bogie, the manner in which the usual rolled-steel sections are welded, and riveting is thereby eliminated, can be observed; the only riveting retained is on those parts which require fairly frequent removal such as the brakework, axleguards and liners. The elimination of rivet holes has made it possible in some instances to use lighter sections. The underframe, also of steel sections, follows the general standard design except for the substitution of welding for riveting, and actually the welded joints have been designed to give greater strength than would be secured if these were riveted; this method of construction, moreover, has made it possible to preserve a flush top, thus enabling the steel key sheeting which forms the floor base to be welded directly on to the underframe.

By Mr. Stanier's courtesy we are now able to give additional and more detailed particulars, and to reproduce photographs and drawings which will further explain the methods adopted. Before work could be carried out it was necessary to produce a jig of sufficient length and stiffness on which to assemble the various members of the frame to be welded. The diagrammatic drawing reproduced shows the jig and frame specially designed and built for the purpose. This was completely fabricated in the shops at Derby. The races marked *A* on the drawing are split in the middle, and can be opened in order to take the underframe out. The jig itself is 70 ft. long and is mounted in the races on roller bearings and ball bearing plummer blocks mounted on stands at each end. These blocks carry a 3-in. dia. shaft running the full length of the jig, and the power drive is attached to the shaft; heliocentric reduction gear is incorporated and this, together with the spur gear reduction of 4 to 1, provides a total reduction of 3,120 to 1 on the main driving shaft. The motor is controlled by start and stop push buttons, and may be reversed. With a jig of this description available, it is possible to complete the underframe by downhand welding, and at no point is horizontal or overhead welding resorted to. The races are spaced 35 ft. apart, the jig thus being supported at four points, two main points being provided by the roller bearing races, and the design is such that these carry the bulk of the load.

The underframe, which is 69 ft. long over headstocks and weighs approximately 7 tons, resembles very closely a riveted frame, and, in order that the utmost stiffness shall be obtained, it has not been sought to effect any particular saving in weight, the essential feature, as the frames are used for sleeping cars, being smooth riding. The sizes of most members are exactly the same as used in the riveted design, and the saving in weight is due alone to the omission of rivets, and the fact that some

of the gusset plates have been reduced in size. The result is exactly what was aimed at, i.e., the achievement of extreme stiffness.

The underframe is built with an upward camber from bogie centre to bogie centre of $\frac{1}{4}$ in.; the portions between the bogie centre and the headstock are level. The gusset plates and cross straps have been welded flush with the top of the underframe so that, as mentioned above, the key sheeting for the floor can be welded directly on to the flanges of the solebars. There is, consequently, no false floor between the body and the frame, and the earlier method of using bottomsides is eliminated.

It may be thought that a construction of this kind would result in a noisier running car, but in practice it is shown that in this respect the car is no way inferior to one having a wooden floor built with bottomsides in the original fashion. As the order was for twenty only, most of the component parts had to be machined accurately to the desired angle, but in an order for a larger number of cars carried through on mass production principles, this expense would, of course, be eliminated, and blanking tools for power presses would be developed.

Sequence of Operations

The planning of the sequence of operations was found to be of the utmost importance, and had to be varied on the first two or three frames in order to eliminate distortion due to shrinkage. The sequence found most suitable for this frame will perhaps be best understood if the accompanying drawings and tables are carefully examined. From these it will be noted that wherever possible the frame is split up into units, and that these units are welded together before placing in position on the main jig.

The solebars offer a special interest as units. The long outrigger plate is first welded together with the supporting brackets, the struts and truss bars being fixed afterwards. In order to get the $\frac{1}{4}$ -in. camber, only $\frac{1}{2}$ in. is put into the bar from bogie centre to bogie centre, and when the truss bar has been welded to the channel it lifts the camber to the desired $\frac{1}{4}$ in. This, of course, is due to shrinkage which takes place locally at the weld.

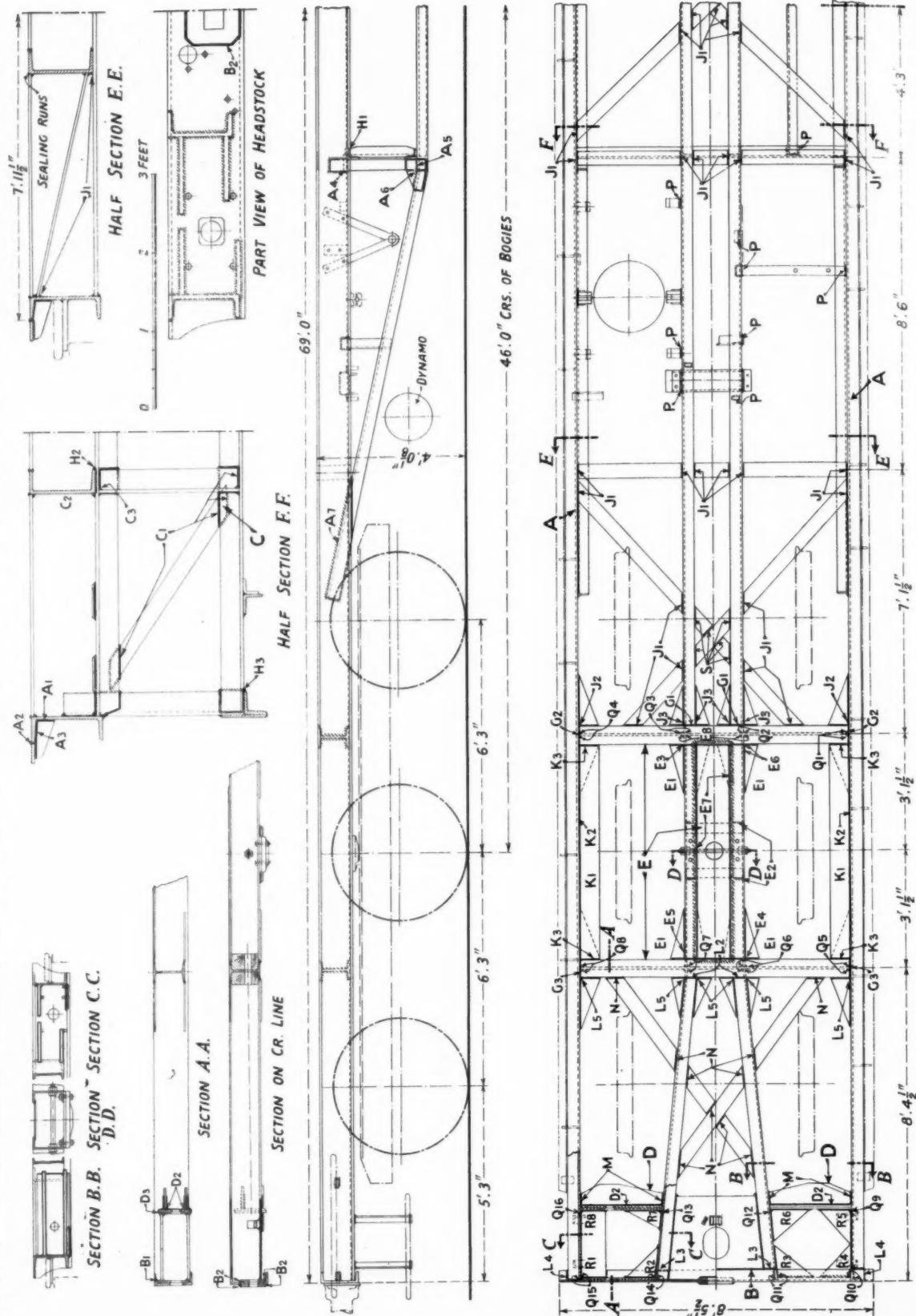
An electrode was selected which gave physical properties slightly better than the mild steel from which the bars are made, the idea being to give the necessary flexibility at the joints.

The Welded Bogies

The six-wheeled bogies on which these new cars are mounted are being built at the company's works at Wolverton. The length of the bogie is 17 ft. 8 in. and the width 6 ft. 6 $\frac{1}{2}$ in., measured in both cases over solebars. The axles have journals 9 in. \times 4 in. and the centres are 6 ft. 6 in. Mansell wheels are fitted, and the tyres are turned to the A.R.L.E. standard profile, with the company's specially modified tread. The wheel diameter is 3 ft. 7 $\frac{1}{2}$ in. and each wheel is braked. The axleboxes and bearings are of the L.M.S. standard pattern.

The laminated bearing springs consist of seven plates, the top one measuring 4 in. \times $\frac{5}{8}$ in. and the remainder 4 in. \times $\frac{1}{2}$ in., these being of the L.M.S. standard for six-wheeled bogies. The auxiliary bearing springs are of india-rubber reinforced with steel plates. The bolster

GENERAL ARRANGEMENT OF 69 FT. WELDED UNDERFRAME, FOR FIRST CLASS SLEEPING CARS, L.M.S.R.



WELDING OF COMPONENT PARTS OF UNDERFRAME

SOLEBARS.—A.

A1—Gusset plates : weld to webs of solebars.**A2**—Soleplates : tack weld and weld in position (on top side), then turn over.**A3**—Underside weld put in (down hand). Solebar gussets also welded on to solebar plates and flanges of solebars. Straighten and rammer in press.**A4**—Two vertical struts welded (solebar lying on toes of flanges).**A5**—Bottom truss bar angles, positioned and welded to vertical struts, gusset plates then clamped.**A6**—Weld diagonal strut angles to vertical struts and to gusset plates, (the tens of angles being free, the welding of gusset plates pulls round ends and these are welded in position.)**A7**—Ends of diagonal strut angles welded to solebars.

HEADSTOCKS.—B.

B1—Buffer plate positioned from bush and weld (down hand) into root of channel.**B2**—Drawbar plates positioned, welded inside and outside.

CROSS FRAME TRUSS UNITS.—C.

C1—Positioned on cross angles (tors down), all members placed in jig, welded.**C2**—Welded on reverse side.**C3**—Vertical welds.

BUFFER TRIMMER UNITS.—D.

D1—Two back plates and two web plates jiggled. (Back plate clamped to baseplate to avoid distortion.)**D2**—Web plates welded.**D3**—Back plates welded.

CROSS BAR UNIT.—E.

Jigged upside down, tack weld temporary tubular stays to keep ends open and resist distortion. Lined up. Bolts on side-friction castings and centre castings, level.

L1—Diagonals placed in jig, headstocks clamped to them and lined up.**L2**—Weld horizontal seams, diagonals to crossbars.

E1—All crossbar to longitudinal gusset plates tacked in position.

E2—Centre castings stops put on, tacked.**E3** to **E6**—Weld crossbars (corner to corner).**E7**—Weld centre plates.

TURN OVER.

Same welding sequence done on unit on reverse side.

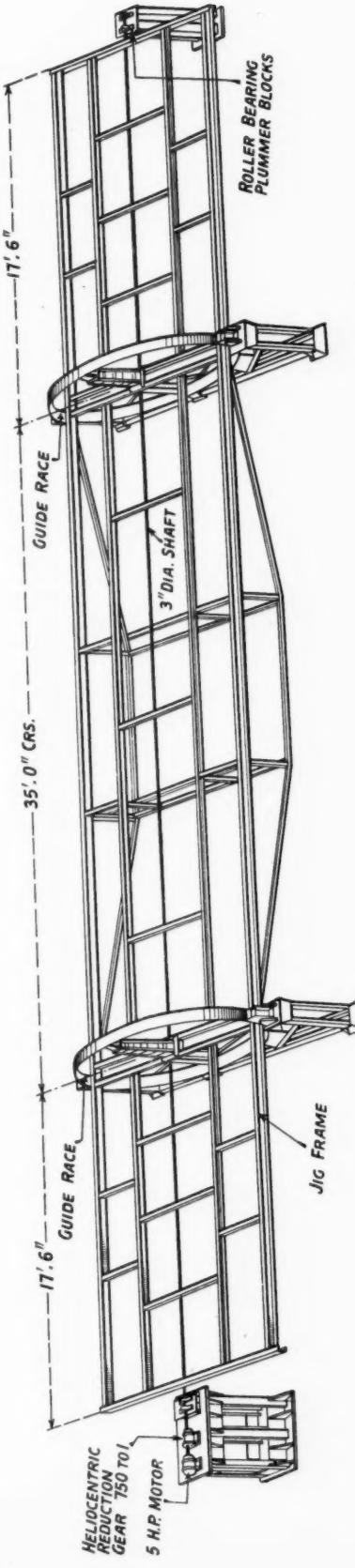
Unit then lifted vertically, for all vertical seams, down hand welded.

E8—Unit allowed to cool off in jig.

MAIN JIG.—POSITION 1. FRAME IN UPSIDE DOWN POSITION

F1—Solebars, crossbar units, longitudinals placed in jig, levelled and tack welded.**G**—Weld horizontal seams as below.**G1**—Crossbar units to inner longitudinals.**G2** and **G3**—Crossbar units to solebars.**H**—Put in cross truss bars.**H1**—Weld to solebars.**H2**—Weld to longitudinals.**H3**—Weld to truss angles.**I1**—Put in inner cross straps, weld horizontal seams underside.**I2**—All gusset plates to crossbars to solebars, positioned, tacked, welded, top and bottom.**I3**—All gusset plates to cross bars to longitudinals, positioned, tacked, welded, top and bottom.**K**—Gusset plates (long) to solebars and crossbars.**K1**—Gusset plates (long) to solebars and crossbars tacked in position.**K2**—Long strains to solebars step back welded to avoid distortion between crossbar units.**K3**—Weld to crossbar.**L**—Diagonals placed in jig, headstocks clamped to them and lined up.**L2**—Weld horizontal seams, diagonals to crossbars.**L3**—Weld diagonals to headstocks.**L4**—Weld solebars to headstocks.**L5**—Position, tack weld, weld (top and bottom), diagonal gussets, outer crossbars to solebars.**M**—Buffer trimmer plates positioned, horizontal seams welded to solebars and diagonals.**N**—End diagonal straps put in and welded to crossbars and diagonals.**P**—Dynamo, gas cylinder components, and step irons, solebar step irons, welded.**Q**—All vertical seams down hand welded.**Q1, 4, 5, 8**—Vertical welds crossbars to solebars.**Q2, 3**—Vertical welds longitudinals to crossbars.**Q6, 7**—Vertical welds diagonals to crossbars.**Q9, 15**—Vertical welds trimmer units to solebars.**Q10, 14**—Vertical welds trimmer units to diagonals.**Q12, 16**—Vertical welds solebars to headstocks.**Q11, 13**—Vertical welds diagonals to headstocks.**R1, 4, 5, 6, 7, 8**—Tack weld buffer housing gusset plates.Reverse jig into opposite vertical position. **4** weld opposite sides to those Frame turned to original position, **1**, horizontal seams of buffer housing gusset plates welded, **R1, 4, 5, 6, 7, 8**.Gusset plates which connect top and bottom diagonals to headstocks fitted in and bottom seams **R2, 3**, welded in.

Frame taken out of jig, turned right side up and placed on trestles.

The welding is then completed to buffer housing gusset top side, diagonal to headstock gusset top side, also intermediate centre diagonal straps positioned and welded. **S**, also intermediate centre diagonal straps

Diagrammatic sketch to illustrate operation of revolving jig

Solebar (as shown in Figs. A and B)

Order of Welding	Description of Operations
	"Tack-weld" axleguards and b-wing spring brackets to solebar. Bearing spring brackets to solebar (removed from jet). Axleguards to solebar.
1-16	Bearing spring brackets to solebar (removed from jet).
17-31	Bearing spring brackets to solebar.
32-37	Web plates [in any order].
38-41	Axleguards to solebar.
42-43	Strengthening angle to solebar.
44-45	Axleguards to solebar.
46-48	Axleguard stiffeners to axleguards.
	Bag Frame (as shown in Fig. C).
	"Tack-weld" crossbars to solebars (upper sides of both flanges) in jig, same order as welding 1-4 . Crossbars to solebars, upper sides of both flanges. Longitudinals to crossbars, upper sides of both flanges, both ends simultaneously (B.E.S.). Longitudinals to headstocks, upper sides of both flanges, both ends simultaneously (B.E.S.). Longitudinals to crossbars, upper sides of both flanges, both ends simultaneously (B.E.S.). Longitudinals to create trunnion, upper sides of both flanges, both ends simultaneously (B.E.S.). "Tack-weld" transom bar brackets to solebar webs, (B.E.S.). Crossbar to solebar webs (B.E.S.). Transom bar to longitudinal webs (B.E.S.). Crossbars to longitudinal webs (B.E.S.). Headstocks to longitudinal webs (B.E.S.). "Tack-weld" longitudinal webs (B.E.S.). Headstocks to headstocks to solebar webs (B.E.S.). Brake block hanger brackets to headstocks (B.E.S.). Brake block hanger brackets to trunnions (B.E.S.). Brake block hanger brackets to transom bar brackets (B.E.S.). Vertical lever brackets to trimmers (B.E.S.). Brake equalizer step to trimmer. Crossbar and longitudinal roussets. Solebar and headstock gussets. Solebar and crossbar gussets.
1-16	
17	
18	
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The diagram shows an inverted plan of a Solebar structure. The top part is labeled 'FIG. A. INVERTED PLAN OF SOLEBAR'. It features a central vertical column with horizontal sections extending to the left and right. Various dimensions are indicated along these sections, such as 3' 3" for the height of the central column, 6' 3" for the total width, and 4' 4" and 4' 5" for other horizontal spans. Numerous small numbers (e.g., 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56) are placed near specific structural elements. The bottom section of the diagram shows a more detailed view of the base and foundation, with dimensions like 6' 3" and 4' 4".

FIG. B. ELEVATION OF SOLEBAR

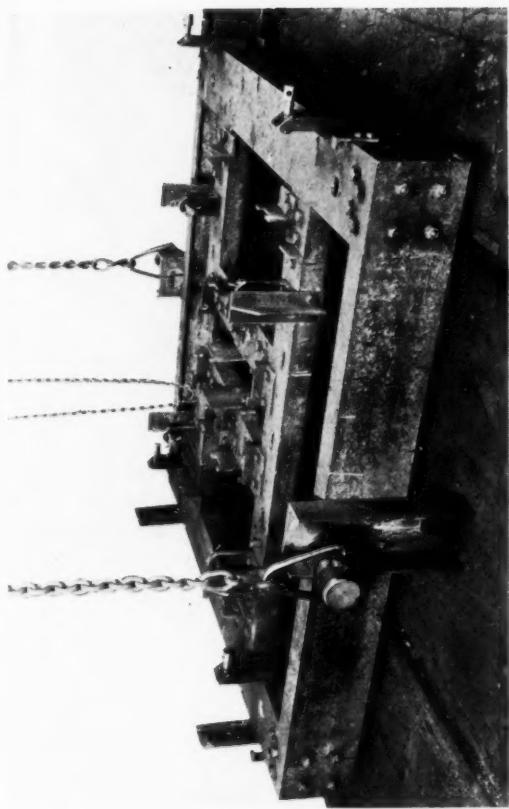
FIG. C. PLAN OF BOGIE FRAME

The drawing consists of two parts: FIG. B (Elevation) and FIG. C (Plan).
FIG. B (Elevation): Shows a side view of a bogie frame. It features a central longitudinal solebar (part 7) with a crossbar (part 8) at the top. A transom bar (part 17) connects the longitudinal solebars. A bearing spring bracket (part 4) is attached to the left longitudinal solebar. A stiffening angle (part 3) is positioned above the top of the longitudinal solebars. Various dimensions are indicated: 13, 30, 15, 32, 40, 1, 13, 17, 5, 10, 22, 36, 33, 34, 33, 35, 20, 21, 9, 6, 18, 21, 27, 38, 25, 23, 39, 12, 16, 31, 30, 29, 20, 17.8, 31, and 32.
FIG. C (Plan): Shows the plan view of the bogie frame. It includes the longitudinal solebars, crossbar, transom bar, and various brackets. Dimensions shown are 17.8, 31, 30, 29, 20, 12, 16, 31, 39, 14, 2, 25, 38, 27, 18, 6, 9, 21, 21, 18, 27, 38, 25, 23, 39, 12, 16, 31, 30, 29, 20, 17.8, 31, and 32.

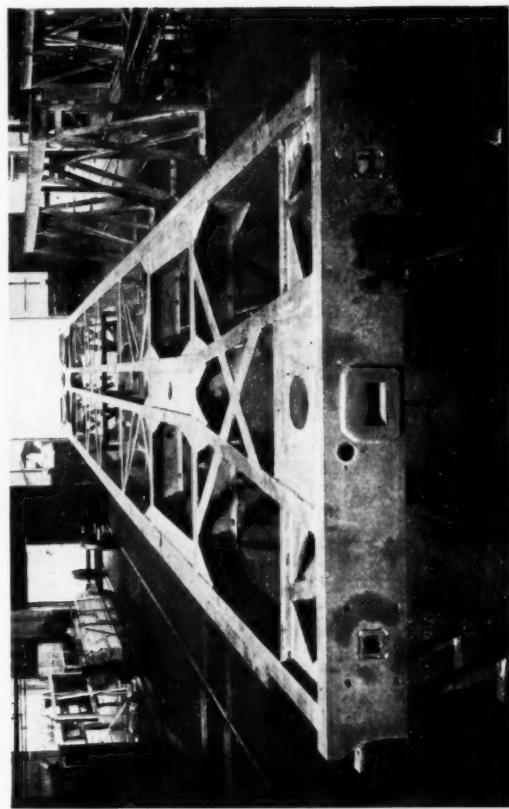
Bolster (as shown in Figs. E and F).

Order of Welding	Description of Operations
	Weld stiffener plates to longitudinals (upper sides of both flanges before assembling).
	Insert members in jig and
1-4 ×	"Tack-weld" longitudinals to transom (upper sides of both flanges).
5-8 ×	"Tack-weld" longitudinals to crossbars (upper sides of both flanges).
9-12 ×	"Tack-weld" diagonals to crossbars (upper sides of both flanges).
13-16 ×	"Tack-weld" diagonals to transoms (upper sides of both flanges).
17-20	Welds follow in same order as above, i.e.
21-24	Longitudinals to transom (upper sides of both flanges).
25-28	Longitudinals to crossbars (upper sides of both flanges).
29-32	Diagonals to crossbars (upper sides of both flanges).
33	Centre longitudinal to crossbars (inside web and flange).
34	Centre casting plate and 8 gusset plates (on top faces). Jig is now turned on one end and
35	All visible joints and two friction plates welded. Jig turned on opposite end and
36	All visible joints and the 2 remaining friction plates welded.
37	Brake block hanger brackets to crossbars. Bolts removed from fig. and turned as required.
	Remaining visible joints.
38	Gussets, fossil bar and longitudinal lower faces.
39	

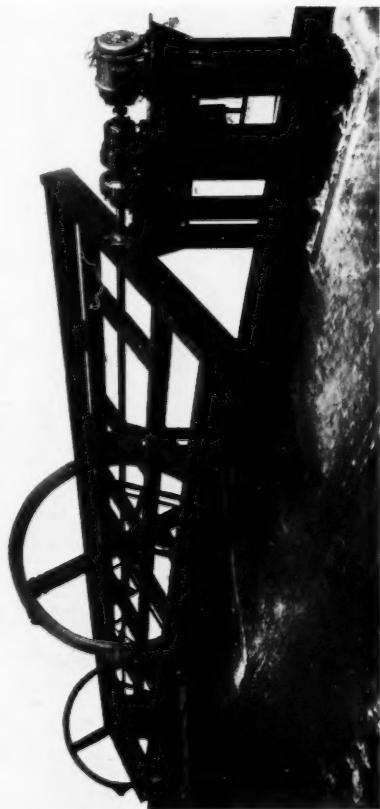
Transome (Fig. D)	Order of Welding	Description of Operations	
	Weld distance pieces to bottom plate and web plates into channels, before assembling.	Top plate to transomes.	1-4
	Bottom plate to transomes.	Top plate to transomes.	5-8
	Top plate to transomes (completion).	Tack weld spring seats to channels (four points per seat). Remove from jig.	9-20
	21-28	Bottom plate to transomes (completion).	21-28
	29-40	Spring seats to channels, and	join up 1-4, 2-3, 6-7, and 5-8



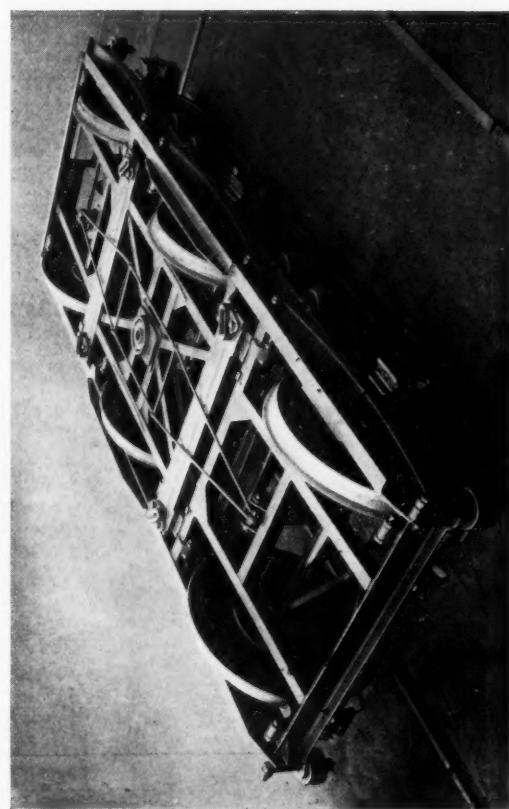
Jig for bogie bolster



All-welded flush top steel underframe.



Revolving jig for underframe tipped left



Six-wheel bogie completely welded except parts requiring fairly frequent renewal

NEW FIRST-CLASS SLEEPING CARS, I.M.S.R.

springs consist of four nests of coil springs, each nest carrying 3 tons 10 cwt. at the normal height of $7\frac{1}{2}$ in., and the two springs comprising each nest are concentric. The swing beams which carry the bolster through the medium of the bolster springs are comprised of channels measuring 8 in. \times $3\frac{1}{2}$ in. \times $\frac{1}{2}$ in.; these beams are suspended from the bogie frame by means of swing suspension bolts and rocking bars.

The bogie centre is of cast steel and is lubricated by means of oil wells in the casting, the oil being fed to the concave bearing surface by sprung felt pads with leads into the oil wells. The oil in these wells is sufficient to last between lifting periods. The four side friction blocks are of cast iron and are lubricated similarly to the centre casting. The vertical side friction plates, of mild steel plate on the bolster, are welded to the transoms, whilst those against which they bear are of cast iron, and bolted to the bogie crossbars.

The constructional members of the bogie frame and bolster are of the British Standard rolled steel sections, and are as follow:—

Bogie Frame—

Solebars, channel, 10 in. \times $3\frac{1}{2}$ in. \times 0.485 in.
Headstocks, unequal angle, 6 in. \times 3 in. \times $\frac{1}{2}$ in., excepting that adjacent to dynamo driving axle which is channel, 9 in. \times $3\frac{1}{2}$ in. \times $\frac{1}{2}$ in.
Crossbars, channel, 8 in. \times 3.7 in. \times 0.625 in.
Longitudinals, unequal angle, 6 in. \times 3 in. \times $\frac{1}{2}$ in.

Bolster—

Transoms, channel, 8 in. \times 3.7 in. \times $\frac{1}{2}$ in.
Crossbars, " 6 in. \times $3\frac{1}{2}$ in. \times 16.48 lb.
Longitudinals, " 7 in. \times $3\frac{1}{2}$ in. \times $\frac{1}{2}$ in.
Longitudinal (centre) channel, 5 in. \times $2\frac{1}{2}$ in. \times 10.22 lb.
Diagonals.

In the preparation of the members for assembly, milling and drilling are almost eliminated, the members being mostly cut to correct length on a Heller circular saw, in

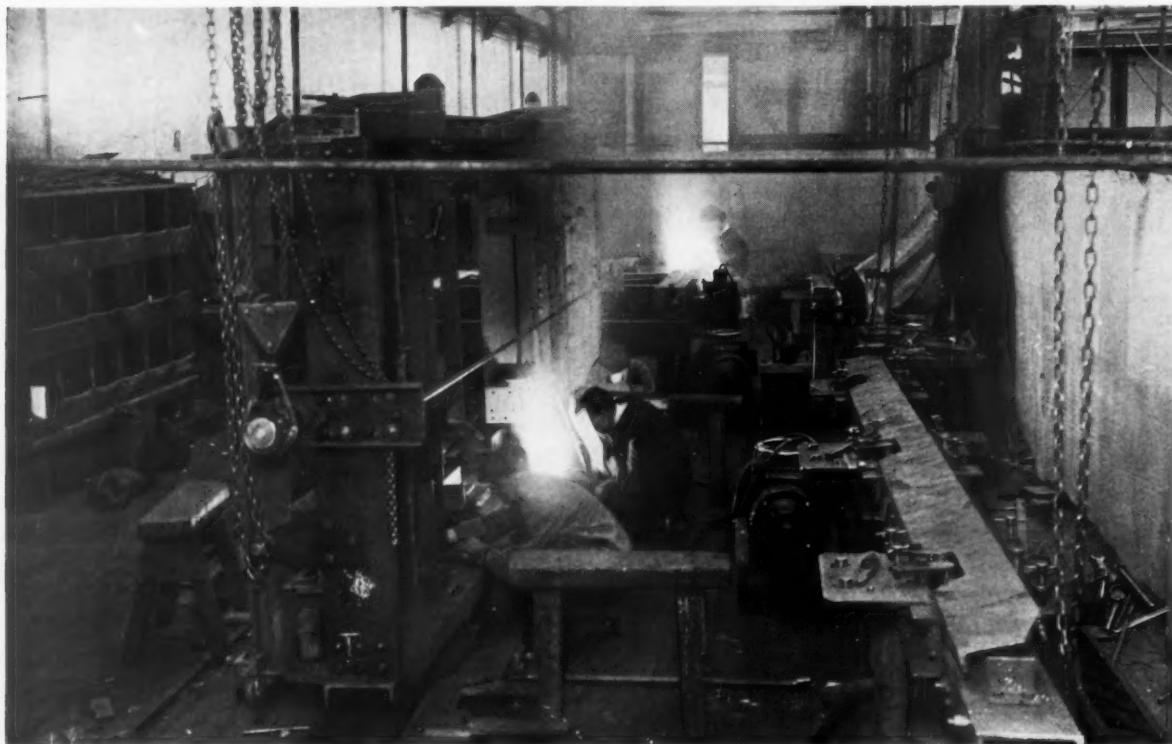
order to butt closely together when assembled. With the exception of the several renewable components, the whole of the bogie members, including those of the bolster, are electric arc welded; the result is a saving in weight over the previous riveted type of bogie, by elimination of joint knees, and increased rigidity of the structure as the welded joint is stronger than the riveted one. It will be observed from the drawing on page 872 that the junction of both bogie frame and bolster members has been reinforced by welding $\frac{1}{4}$ -in. triangular gusset plates across the joint. Various channel members are stiffened to suit their loading by web plates welded within the flanges where the loads are disposed.

Constructional Methods

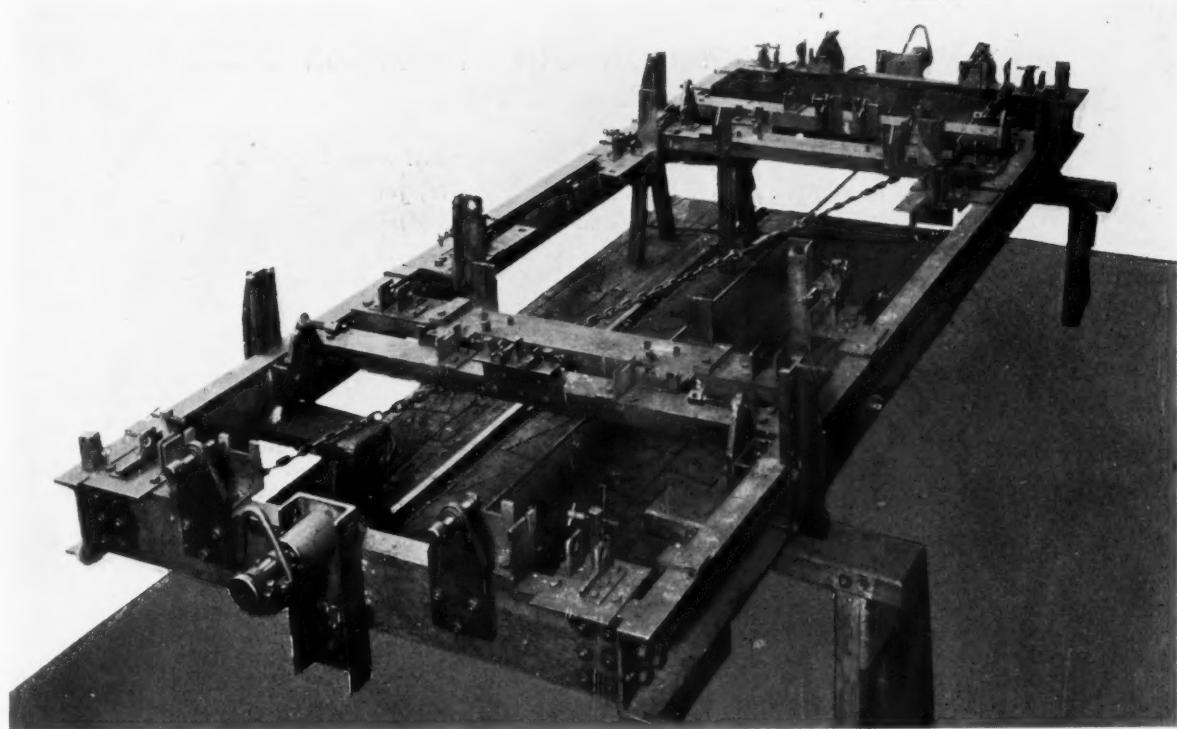
The procedure adopted for the construction is to assemble the various members in jigs. There are four distinct groups of welding operations; two for the bogie frame and two for the bolster. These are shown in the illustrations, from which it will be seen that the two large jigs are arranged to revolve, in order to enable the welds to be made horizontally as far as possible.

The welding procedure is as follows: after careful squaring and alignment of the components, they are tack-welded to the solebar. The welding then proceeds in the order shown on the drawing, which was arrived at after careful investigation so as to overcome the tendency to distortion in this particular member. The next group of welding operations is on the bogie frame after the various members have been assembled in the jig.

After tack-welding the crossbars to the solebars, the welding proceeds in the sequence shown. At C in the drawing, and in certain other illustrations, is seen the completed frame. It will be seen from the sequence table that much of the welding takes place at both ends of the frame simultaneously, and this helps to minimise distortion.



Bogie frame being welded in revolving jig



Jig for six-wheel bogie frame

The two groups of operations covering the construction of the bolster are shown at D, E, and F, and are carried out in two jigs, one for the transom and the other for the complete bolster. At D is shown the completed transom and the order of welding adopted. Distance pieces and web plates are welded prior to assembly. After insertion in the jig the transoms are first welded to the top cover plate in four sections on either side of the centre sections. The jig and transoms are next inverted and the latter welded at lower corresponding places through slots provided in the jig. The sequence of the top and bottom welds is followed throughout. The bolster spring seats are only tacked to the transoms in the jig, their complete welding being effected after removal therefrom. These operations apply to each transom.

The welding of the complete bolster now proceeds. Both transoms and the remainder of the bolster members are assembled in a jig, and after correct location and squaring,

are tack-welded at requisite points, both top and bottom. The welding of the longitudinals to the transoms and cross-bars follows, the whole of the welding sequence being as shown on Figs. E and F. This order of welding counteracts the tendency to distortion. Before welding the side friction plates to the transoms, they are correctly set to give the required working clearances with the side friction castings on the bogie crossbars. After the welding is completed, the welded surfaces are cleaned and painted with a special preparation, and the remaining constructional work on the bogie proceeds as on the ordinary riveted type of bogie.

The whole of the welding is carried out with New Fleetweld $\frac{1}{8}$ -in. electrodes, on a load varying from 175 to 180 ampères, $\frac{5}{16}$ -in., $\frac{1}{4}$ -in., or $\frac{3}{16}$ -in. continuous fillet welds being made throughout. The weight of this welded bogie is 7 tons 6 cwt. and that of a similar type, riveted, 7 tons 13 cwt.

ELECTRIFICATION RESULTS ON THE HAYES BRANCH, SOUTHERN RAILWAY.—Just over 10 years ago the little branch line from Elmers End to Hayes was opened for electric traction. This line was incorporated as the West Wickham & Hayes Railway Co. under an Act of July 9, 1880, and from the outset received the backing of the S.E.R. which purchased it at a cost of £162,000 under an Act of August 11, 1881. It was opened on May 29, 1882, and caused some anxiety to many proprietors, who questioned the wisdom of its construction, for its sponsor's only argument was that it passed through beautiful country, which, situated near London, would be suitable for building development. That this assumption was well founded is evident from the figures reproduced below, but no real development was apparent until a few years ago and was primarily the result of electrification. In 1912 there was a branch train working trips approximately every hour,

augmented by a few through trains in the business hours. If one desired to visit a London theatre, this could be done only on a Wednesday and then only by changing at Elmers End. With the introduction of electric trains, the service became a half-hourly one, and now the winter timetable provides for four trains an hour throughout the day, two of them terminating at Elmers End in the non-business hours. It is interesting to note that since electric services were inaugurated the gross receipts have increased almost twelvefold.

Station	Year	Passenger tickets issued	Passenger tickets collected	Season tickets issued
Eden Park ..	1934	75,841	133,670	4,188
	1925	8,358	12,458	61
W. Wickham ..	1934	251,024	246,682	18,711
	1925	46,985	63,389	336
Hayes ..	1934	177,424	220,571	5,831
	1925	21,856	53,688	159

NEW PETROL-DRIVEN RAIL AND INSPECTION CARS FOR OVERSEAS SERVICE

The vehicles herewith illustrated and described have been built by D. Wickham & Co. Ltd., of Ware, Herts, for the Dorada Railway of South America, and the South African Railways

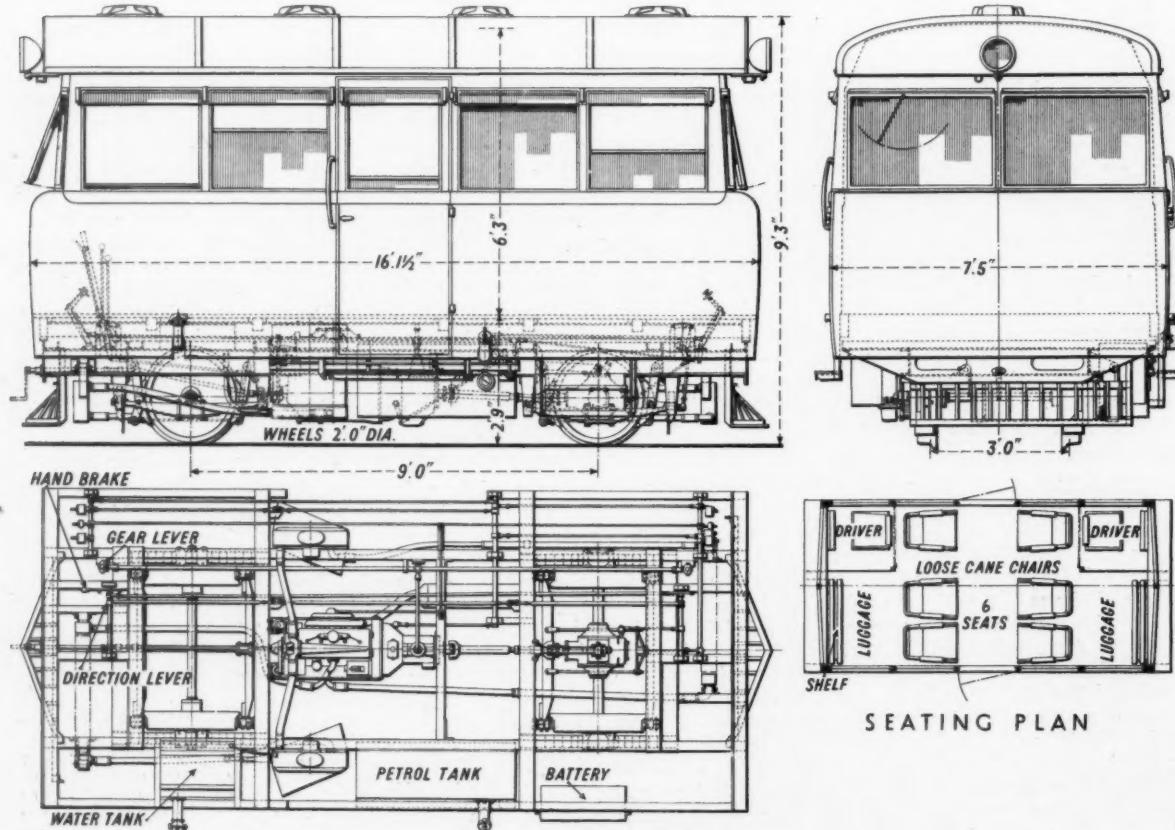
DURING a recent visit to the works of D. Wickham & Co. Ltd. of Ware, Hertfordshire, we were able to inspect a passenger railcar which the firm was building for the Dorada Railway of South America, and inspection cars constructed for the South African Railways. Both productions are petrol driven, the engines being of standard Ford types.

The passenger vehicle for South America was required to permit of a daily service, carrying six first class passengers in comfort in a vehicle which should be reasonable both in regard to first cost and running expenses. Gradients of 4 per cent. have to be negotiated and the vehicle will operate on a route between 1,000 and 9,000 ft. above sea level. Taking all these circumstances into consideration, a lightweight vehicle was essential, the design illustrated being adopted.

The principal feature of the design apart from light construction is the placing of the engine, transmission and cooling radiators completely under the floor boards, leaving the floor of the car clear for any desired arrangement of seating, which in this case comprises six wicker arm-

chairs, specially made by Dryad Limited, fitted with loose cushions. The chairs are not fastened in any way but the feet have rubber buttons to prevent movement. The chassis is of pressed steel channel electrically welded to form one homogeneous unit, a practice adopted by the builders for railcars during the past three years with successful results. The standard Ford engine has an R.A.C. rating of 24 h.p. and develops a maximum output of 52 b.h.p. The clutch and gearbox are also standard Ford products, a lorry type 4-speed box being fitted in this case.

The cooling system comprises two main radiators one on each side of the engine with one auxiliary radiator at each end of the car; a large capacity header tank is incorporated in the system. The transmission to the driving axle is by an open carden shaft, with universal joints at each end, to an enclosed bevel reverse box mounted on the drive axle. These bevels of hardened steel are mounted on ball bearings; a dog clutch sliding between the two engages with either at will, affording equal ratios in both directions of running. Duplicate controls are pro-



Details of petrol-driven passenger railcar for the Dorada Railway of South America

vided at each end of the car. The driving seats having Peters' accordion pleated anti-glare curtains at the rear to avoid reflections from the windscreen at night.

The saloon type body is framed in hardwood, panelled outside with aluminium and lined inside with mahogany faced plywood up to the waistline; the interior above this, including the roof, is plywood lined and painted cream colour, whilst the ceiling lights are opal shaded and sunk into the lining. The exterior of the roof is panelled with aluminium and carries Airvac two-way operation ventilators. Additional ventilating louvres are fitted at each end of the car at floor level; all ventilators are fitted with adjustable shutters. The side windows are of the full drop Beclawatt type, fitted with safety glass and top louvres; the front and rear windscreens are of the opening type hinged from the top.

Full electric lighting and starting is fitted, with standard Ford equipment except for the interior lights. The car was built to the requirements and under the direction of Messrs. Sir Douglas Fox & Partners, Consulting Engineers, London.

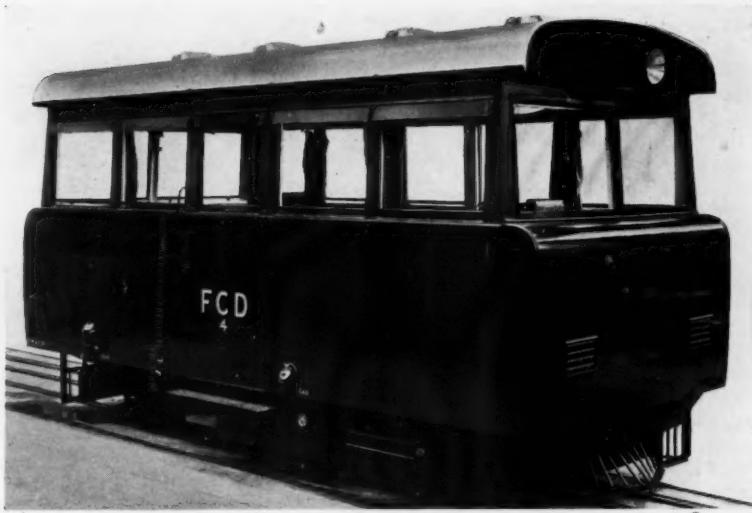
South African Railways Inspection Car

In the construction of this car, one of a series of three, the chassis is again of pressed steel electrically welded and the power unit a standard Ford 24-h.p. engine with four speed gearbox controlled from either end of the

External view of Dorada Railway passenger car

car. A feature of these controls is the fact that all of them, *viz.*: foot throttle, foot brake, reverse lever, gear change lever and hand ratchet brake lever, are detachable, leaving the non-driving end of the car free for the stowage of luggage or tools.

The engine is placed low down under the double seat and the normal radiator cooling fan is retained, but in this case its purpose is to ventilate the engine compartment and keep it clear of hot fumes arising from the exhaust manifold. The radiator cooling system is also worthy of note. The normal Ford type impeller circulating



Interior view of the above car

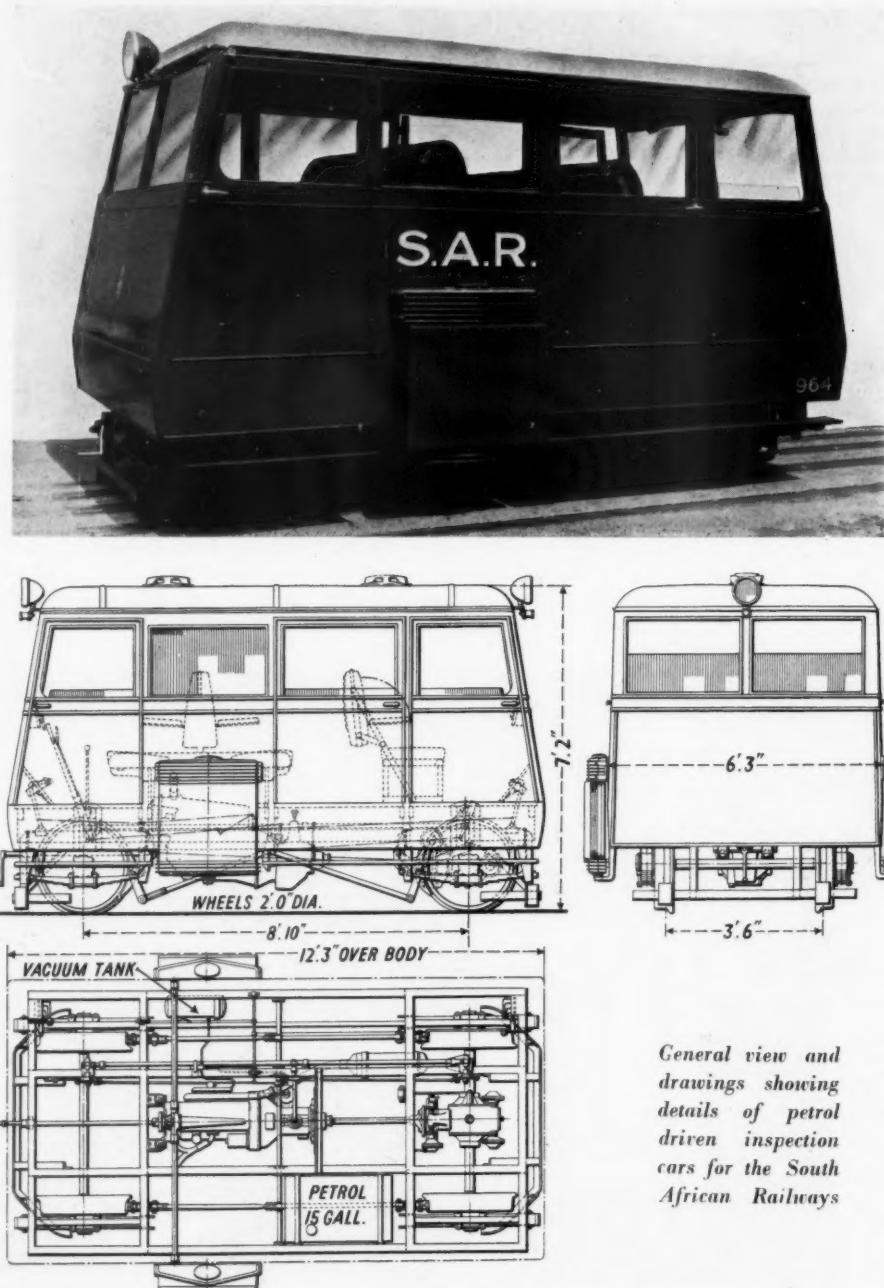
pump is retained but with the addition of a twin outlet pump casing, the outlets being arranged on opposite sides. Two radiators are fitted, one on each side of the car, in which position they are safe from accidental damage and open to cooling air irrespective of direction of running. This position also keeps the circulating pipes very short and free from bends so that in the event of pump breakdown, cooling is maintained on a thermo-syphon circulation.

One or two departures from usual practice are evident in the duplicate control system. The first is the elimination of any separate clutch control, the clutch being operated automatically by suction in combination with a valve fitted to the throttle connections. When idling with the throttle pedal completely shut, the clutch is automatically withdrawn by means of a suction cylinder. The first movement of the throttle pedal does not open the throttle but closes the suction cylinder valve and slowly admits air, causing the clutch to take up smoothly. With this arrangement it is then possible to cruise at high speed under favourable conditions, such as a strong following wind or slight down grade, at small throttle openings with no fear of the clutch being slightly withdrawn and so causing slip. Two other suction or vacuum controls are fitted, one operating the reverse mechanism by means of diaphragms and the other the transmission brake.

The transmission brake is of special design and fitted to the front end of the reverse box; the drum is hollow and fitted with curved blades similar to a Sirocco fan. The external contracting shoes are also hollow and fitted with escape ports, so that when running a continual blast of air is driven over the braking surface for cooling purposes. The necessary vacuum for these fittings is taken from the induction pipe, and it will be noted that all three operations mentioned above are required only when the throttle is shut and the available vacuum at its highest figure.

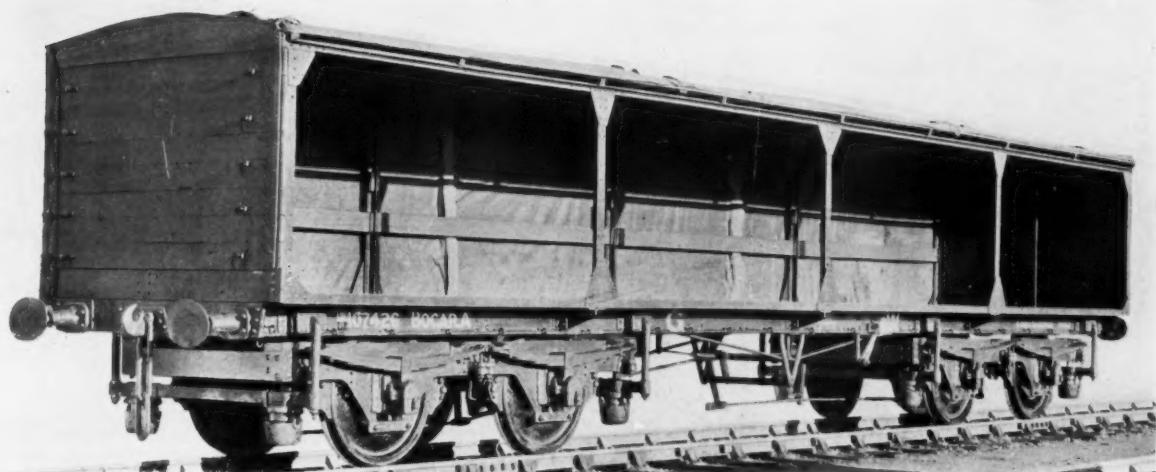
The suspension of this vehicle also possesses novelty, in that no horn plates are fitted and the springs are underslung on to the axleboxes. The suitability of such a system for this type of vehicle is proved by the fact that the car

will run steadily without nosing or swaying at speeds exceeding 50 m.p.h. The wheels are a departure also from usual inspection car practice insofar as they are fitted with shrunk-on steel tyres, and in order to keep down the weight the steel centres are fabricated from steel plate and rolled sections. The axles are of high tensile steel running in S.K.F. self-aligning roller bearings.



General view and drawings showing details of petrol driven inspection cars for the South African Railways

The tendency to regard light-weight vehicles of simple construction such as these as demanding less than the ordinary amount of care and thought in their design is dispelled when all the various factors entering into the construction of the vehicles is fully taken into account. This was very clearly brought home to us as the result of the inspection we made at the builders' works.



British Freight Rolling Stock

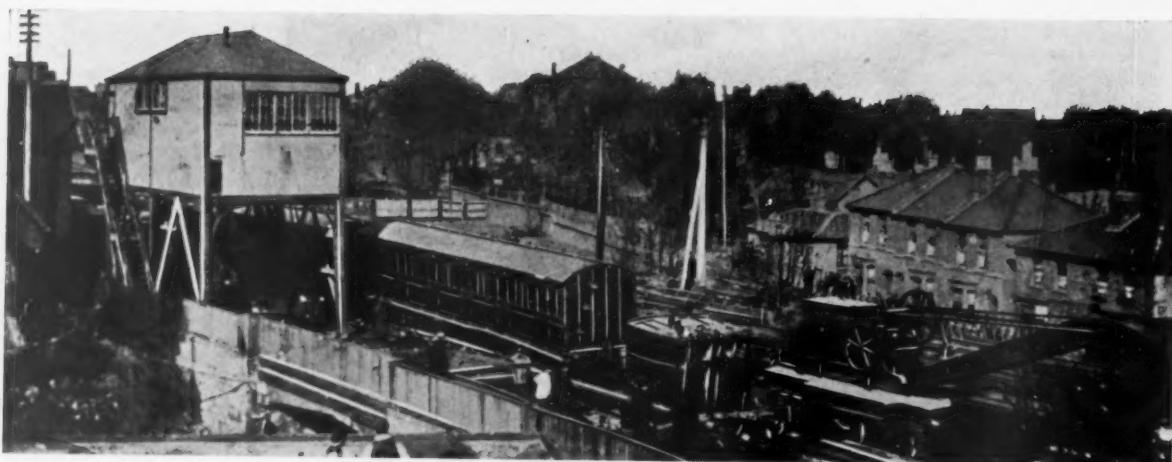
IV.—G.W.R. types for special classes of traffic

For handling the important traffic in motor bodies from manufacturers' works, the G.W.R. uses special wagons of the type shown in the top illustration. The bodies are loaded across the wagon, the sides of which are left open for loading and unloading purposes, and covered with sheeting whilst the vehicle is in transit.

The 20-ton end and side door coal wagon was introduced for working in the Welsh coal trade. For shipment traffic the end doors are available, but the wagons can be used for inland traffic, the unloading being then performed through the side doors. The tare weight is 9 tons 12 cwt.

The covered wagon is for the conveyance of bananas. This vehicle is insulated and equipped with internal pipes for steam heating; it is fitted with vacuum brake for express train running. The capacity is 10 tons, and the tare weight 8 tons 5 cwt.

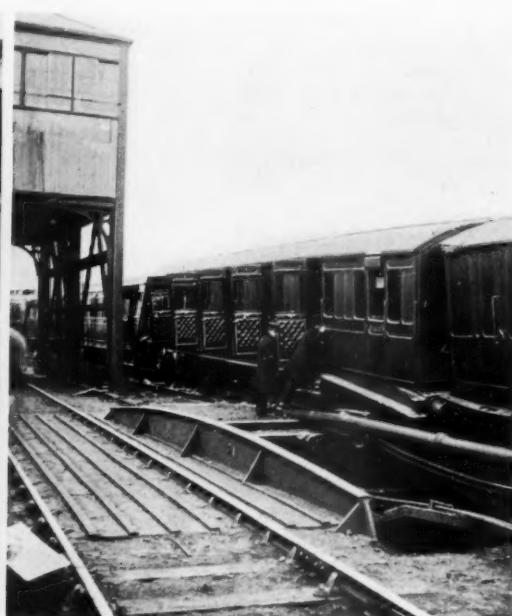
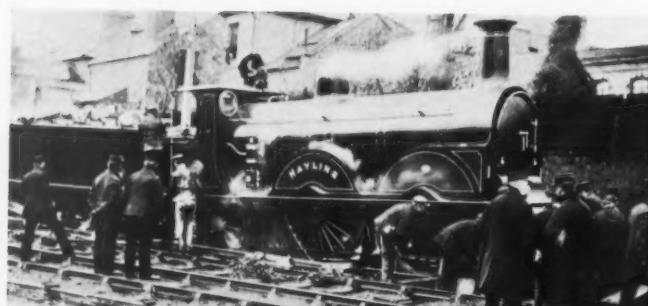




The rear brake van standing on end after falling through the 20-ft. cast iron trough span that had failed



The engine and first two vehicles as they came to rest after derailment



Above : Mr. Stroudley's 0-4-2 type locomotive No. 175 'Hayling' as it came to rest. Below : The two coaches immediately preceding the rear brake van, that were slightly damaged

Another view of the rear bogie coach and brake van before the latter fell into the roadway. The adjacent span of the bridge is in the foreground

NORWOOD JUNCTION ACCIDENT, L.B. & S.C.R., IN 1891, WHICH RESULTED IN THE EXAMINATION AND RENEWAL OF MANY CAST IRON BRIDGES (see article opposite)

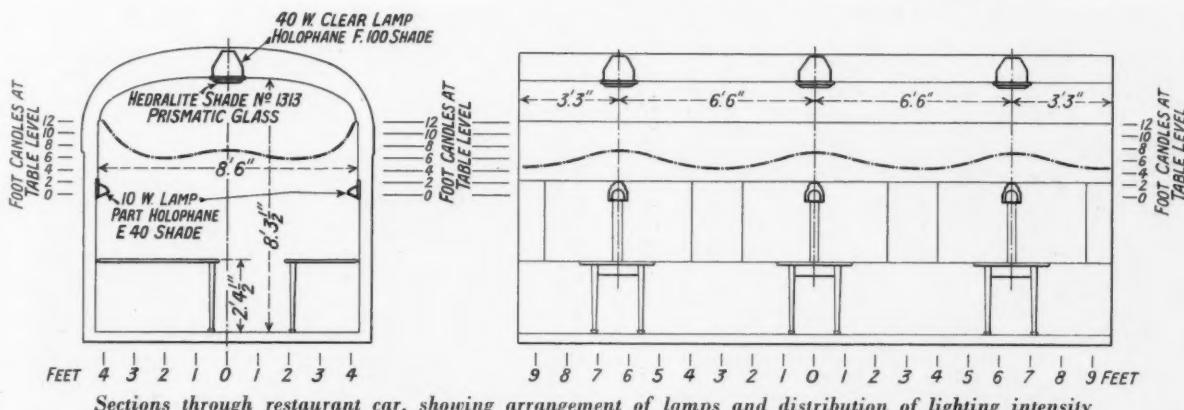
Special Lighting in New Dining Cars, New South Wales Government Railways

The Department of Railways recently placed in service two new dining cars, to the design of Mr. H. Young, Chief Mechanical Engineer, the electric lighting of which opens up a new field in railway carriage illumination. The dining saloon is divided in two, each half having seating accommodation for 18 persons at six tables. In line with each pair of tables is fitted a satin-finished prismatic plate, 12½ in. square (supported by a narrow chromium-plated frame), flush with the ceiling. Between the ceiling and roof are placed the prismatic reflector fitting and lamp. Also on the pillar at the side of each table is a lighting unit comprising a portion of a standard prismatic reflector held in a specially designed fitting. Gas-filled 40-W. and 10-W. lamps respectively are used in the ceiling and side fittings.

The result of the combination is a high efficiency together with a very pleasing effect, and although the table illumination averages more than 6 foot-candles, there is an entire absence of glare. The kitchen and pantry are equipped with four 40-W. lamps in open prismatic reflectors, from which an illumination of twelve foot-candles is obtained on the working plane. The refrigerator cabinet is lighted with 5-W. lamps which are operated by the opening and closing of the various doors.



The even illumination of the whole car and adequate lighting of each table is apparent in this interior view



Sections through restaurant car, showing arrangement of lamps and distribution of lighting intensity

The Norwood Junction Accident of 1891

As the 8.45 a.m. up express from Brighton to London Bridge was passing over Portland Road bridge, Norwood Junction, on May 1, 1891, one of the 20 ft.-span cast iron trough girders gave way. The whole train, consisting of locomotive No. 175, "Hayling," of Mr. Stroudley's 0-4-2 "Gladstone" type, and 12 vehicles was derailed. The last van, a four-wheeler, fell through into the roadway after the train came to rest, which it did within its own length, the driver

having applied the Westinghouse brake immediately he left the rails. The only casualties were very light injuries to five passengers.

The train concerned was that known in later years as The City Limited, and in those days slipped three coaches at East Croydon for Victoria. On the day in question it consisted of the following: a four-wheeled brake, 4 six-wheeled firsts, 2 bogie firsts, a Pullman car, 3 bogie firsts, 2 four-wheeled brakes, first class bogie carriage, and

a six-wheeled first. We reproduce opposite some photographs taken immediately after the accident.

This accident caused much concern not only to the L.B. & S.C.R., but to all other railways in the country, owing to the large number of cast iron under-bridges still in existence. Steps were therefore immediately taken to renew or strengthen any bridges at all likely to fail in a similar manner. On the L.B. & S.C.R. the work, which cost nearly £100,000, was finished in 1895.

November 22, 1935



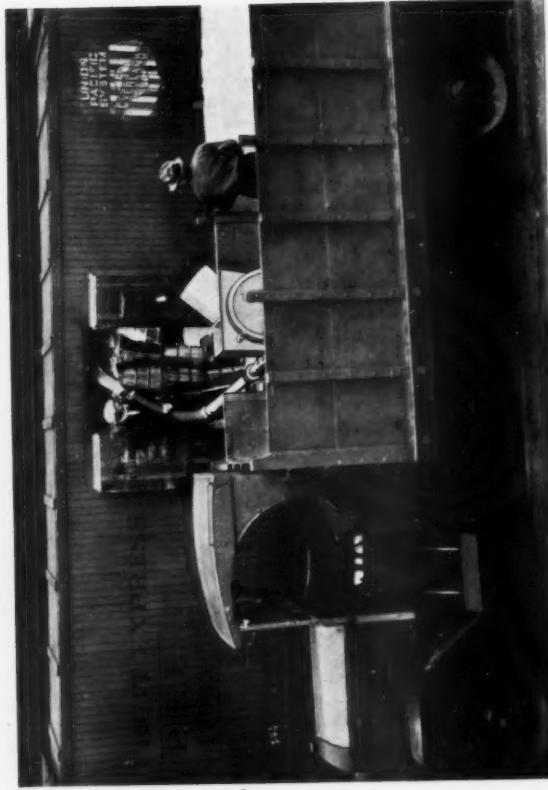
Unloading at Buenos Aires one of the three Sentinel-Cammell steam railcars and three trailers ordered by the Paraguay Central Railway



Interior of the L.N.E.R. Pathé cinema car, in which the 1,000th performance for King's Cross—Leeds passengers will be given tomorrow (see page 862)



Group at King's Cross station, L.N.E.R., at inauguration of library service for Silver Jubilee passengers (see editorial note on page 857)



Spraying market garden produce with ice before transit, by means of the new American plant described on page 863

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RAILWAY NEWS SECTION

PERSONAL

Mr. A. Endicott, M.B.E., F.S.I., who, as announced in THE RAILWAY GAZETTE of October 25, has been appointed to succeed Mr. W. J. Clayton, F.A.I., as Surveyor and Estate Agent to the Southern Railway, on January 1 next, was educated at Tiverton. He was articled in 1903 to a well known firm of Land Agents and

He was awarded the M.B.E. in recognition of his services to the department in 1930.

Mr. H. Gent, who, as announced in our issue of October 18, is retiring in January next from the position of Hotels Superintendent, North Eastern Area, L.N.E.R., joined the former North Eastern Railway and was posted to the office of the Royal

Department, Southern Scottish Area, L.N.E.R., joined the former Great Eastern Railway, at the age of 17, in the year 1907, when he was appointed to the Great Eastern Hotel, Liverpool Street. Subsequently he became an Assistant to the Hotels Superintendent of that line, and, ten years ago, was transferred as Manager of the Royal Station Hotel, Newcastle, L.N.E.R., the position he now vacates to go to



Photo by [Lafayette]

Mr. A. Endicott, M.B.E.,

Appointed Surveyor and Estate Agent, Southern Railway, as from January 1 next

**Mr. H. Gent,**

Hotels Superintendent North Eastern Area, L.N.E.R., 1923-36

**Mr. C. G. Jarrett,**

Appointed Manager, Hotels Department, Southern Scottish Area, L.N.E.R., as from January next

Surveyors at Weston-super-Mare and remained there till the war, when he was commissioned in the Royal Flying Corps and served under Lt.-Col. Sir Henry Fowler—late Chief Mechanical Engineer of the L.M.S.R.—as Officer-in-Charge of Labour and Housing at the Royal Aircraft Factory, Farnborough. Mr. Endicott became Director of Housing Management in the Ministry of Munitions in 1919, and was in technical charge of about 10,000 houses on some 30 estates throughout the country, erected at a cost of £5,000,000. When the work of that Ministry passed to the Office of Works, he remained responsible for these estates under the Director of Lands and Accommodation and also assumed management of all the Coastguards' property and the Bloomsbury Estate acquired by the Government for London University. After carrying through the sale of the housing estates, Mr. Endicott, in 1926, took over charge of the branch of the directorate responsible for the acquisition and management of Government property required for civil purposes in London and the South East of England.

Station Hotel, York, in 1887. Eighteen months later he was transferred to the Royal Station Hotel, Hull, and for the following three or four years assisted generally in its management and that of the York hotel. In the late 90's he was appointed Assistant Manager of the York hotel, and in 1901 was promoted to be Manager of the Hull hotel. In 1904 Mr. Gent became Manager of the Central Station Hotel, Newcastle, and two years later was appointed Manager of the York hotel and Superintendent of all North Eastern hotels, refreshment rooms and restaurant cars. In 1907 increased business necessitated that Mr. Gent should devote his whole time to the latter duties and the appointment of a separate resident Manager at the York hotel. Since the amalgamation he has remained as Hotels Superintendent, North Eastern Area, L.N.E.R., the position from which he is shortly to retire.

Mr. C. G. Jarrett, who, as announced in THE RAILWAY GAZETTE of October 18, has been appointed to succeed Mr. Arthur A. Ryan as Manager, Hotels

Scotland. During the war he served in France, Egypt, and Palestine with the Royal Artillery, and as Battery Captain, from its formation to the cessation of hostilities, with the 74th Dismounted Yeomanry Division. Since the war he has been attached to the 85th East Anglian Brigade (T.A.), and is still on the active list of the Reserve.

Mr. A. C. Rumboll, C.I.E., O.B.E., Agent of the Great Indian Peninsula Railway during 1921, who died recently, left an estate of £35,017 (£34,568 net).

We regret to record the recent death of Mr. Gustav Lindenthal, one of the best known tunnelling and bridging engineers in the United States. Among the works for which he was responsible were the Hell Gate, Manhattan, and Queensboro Bridges, and the Pennsylvania tunnels under the East and Hudson Rivers. His designs for the Hudson Bridge at 57th Street just before the war—which catered for 12 railway tracks and 16 lanes for motor-cars as well as bus and tram lanes—constituted his best-known work. The

November 22, 1935

bridge, which would have cost \$200,000,000, was never built. Mr. Lindenthal was at one time Chief Engineer of the Maryland Central Railroad, and was the original promoter of the Baltimore Belt Railroad as long ago as 1889.

Dr. Angel Sanchez Elia, who, as announced in THE RAILWAY GAZETTE of August 30, has been elected a Local Director and Legal Representative of the Entre Ríos & N.E. Argentine and Buenos Ayres Great Southern Rail-

man of the Local Board of the Entre Ríos Railways and of the Argentine North Eastern Railway.

We regret to record the death in Buenos Aires on October 20, after an illness of several months' duration, of Mr. Gilbert Ramsay Darbyshire, Secretary of the Local Board of the B.A. Great Southern Railway. Mr. Darbyshire was born in Argentina, in 1884, and entered the service of the B.A. Great Southern Railway in October, 1901. At the beginning of 1910 he was

enlarged its scope especially its accident and anti-tuberculosis services. Dr. Fredet has been elected President of the Surgical Society of France.

Mr. Edward Huskisson has been appointed Manager of Thos. Cook & Son Ltd., as from August 1 last. He was educated at Merchant Taylors School and joined Thos. Cook & Son in February, 1898. After gaining valuable experience over a number of years in various positions both in England and on the Continent, he was appointed



Dr. Angel Sanchez Elia,

Appointed a Local Director and Legal Representative, Entre Ríos & N.E. Argentine and B.A.G.S. Railways



The late Mr. G. R. Darbyshire,

Secretary of the Local Board, Buenos Ayres Great Southern Railway, 1919-35



Mr. Edward Huskisson,

Who has been appointed Manager of Thos. Cook & Son Ltd. as from August 1

ways, was born in 1883, at Buenos Aires. In 1908 he graduated from the University of that city as a Doctor of Law and Social Sciences. From 1915 to 1918 he was a Civil and Commercial Judge of the Province of Buenos Aires (Department of the Federal Capital), and from 1922 to 1926 was a National Deputy. He was again nominated as a Parliamentary candidate for the period 1926-1930, but declined to stand for re-election in order to devote himself entirely to his professional work, and was shortly afterwards appointed Lawyer to the Entre Ríos Railways, which post he still occupies. After the revolution of September, 1930, Dr. Angel Sanchez Elia was elected a Director of the Bank of the Nation, which post he resigned in the following year. Among other public positions he holds are those of Legal Adviser to the Buenos Aires Stock Exchange; a Director of the Buenos Aires Southern Dock Company (a subsidiary of the B.A.G.S. Railway), of the Italian-Argentine Electric, and Mihanovich Navigation Companies, Legal Adviser to All-America Cables and Trustee of the Tucumán Sugar Company.

It is with regret that we learn from a Buenos Aires message of the death of Dr. Ezequiel Ramos Mexia, Chair-

promoted to Chief Clerk, and in July, 1919, was appointed to succeed Mr. W. Flint as Secretary of the Local Board. He was also Secretary of the Local Board of the Buenos Aires Southern Dock Company (a subsidiary concern of the B.A.G.S. Railway) occupying both these positions until the time of his death. To the untiring energy and exceptional administrative abilities which made him a valued and trusted servant of the railway for so many years, Mr. Darbyshire added a singular charm of manner and gentle, unaffected courtesy that was irresistible, and his genial, benevolent personality will be much missed by both colleagues and subordinates.

We regret to record the recent death of Mr. Alexander Black, who retired from the position of District Traffic Superintendent, Carlisle, L.M.S.R., in May, 1926, after 48 years' service with the Caledonian and L.M.S. Railways.

Dr. Fredet, Chief Medical Officer of the P.L.M. Railway, retired on October 1. Attached to a Paris hospital in 1907, he was engaged by the P.L.M. as Assistant Surgeon in 1908 and appointed Chief Medical Officer six years later. In 1920 he entirely reorganised his department on modern lines and

Assistant to the Negotiations Manager in London and subsequently himself became Negotiations Manager in 1925, the position he now relinquishes to become Manager of the firm.

INDIAN RAILWAY STAFF CHANGES

Mr. T. S. Sankara Iyer has been appointed to officiate as Financial Commissioner of Railways (Railway Board), during the absence on 2½ months' leave of Mr. P. R. Rau, as from October 16.

Mr. L. H. Kirkness, Secretary of the Railway Board, on return from leave, resumed his duties on October 21.

Mr. S. G. H. Shah, Officiating Deputy Chief Commercial Manager, N.W.R., has been granted eight months' leave as from October 4.

Mr. E. Ingoldby, officiating Chief Controller of Standardisation, has been appointed to officiate as Director of Mechanical Engineering, Railway Board, as from October 13.

We regret to note the death, on November 17, of Mr. T. J. W. Smith, European Freight Manager, Canadian Pacific Railway, since 1919.

The Southern Railway officers—a group of whom we illustrated in our

issue of October 11—who have been visiting the North American Continent, have now returned to England.

R.C.H. SUPERINTENDENTS' CONFERENCES

At a meeting of the Superintendents' Conference held at the Railway Clearing House on November 20, the following were unanimously elected Chairmen of the Superintendents' Conferences for the year 1936:—

Operating Superintendents' Conference

Mr. H. L. Wilkinson, Superintendent of the Line, Great Western Railway.

Coaching Traffic Superintendents' Conference

Mr. C. J. Selway, Passenger Manager of the Southern Area, L.N.E.R.

From the *London Gazette* of November 19: The King has been graciously pleased to approve of the following appointment and award for services rendered in connection with the recent earthquake in Baluchistan:—

To be an Officer of the Civil Division of the Most Excellent Order of the British Empire:—

Mr. B. C. L. Bean, Divisional Superintendent, North Western Railway.

Awarded the Kaisar-i-Hind Medal of the First Class:—

Dr. (Mrs.) C. E. M. Berridge, M.B., Ch.B., Lady Divisional Superintendent, Moghalpura Nursing Division, North Western Railway Corps (wife of Mr. P. S. A. Berridge, Executive Engineer, Bridges, and Editor of the N.W.R. Magazine).

Vickers Limited announces the following changes in the constitution of its board of directors and of the boards of its subsidiary companies, Vickers-Armstrongs Limited and English Steel Corporation Limited, consequent on the death of Sir Mark Webster Jenkinson, K.B.E., F.C.A., and the acquisition by Vickers Limited of the whole of the share capital of Vickers-Armstrongs Limited:—

The following have been appointed to the board of Vickers Limited: Major-General Sir John Humphrey Davidson, K.C.M.G., C.B., D.S.O., and Mr. F. C. Yapp.

As from January 1, 1936, the board of directors of Vickers-Armstrongs Limited will be constituted as follows: Commander Sir Charles Craven, R.N. (Chairman and Managing Director), General Sir J. F. Noel Birch, G.B.E., K.C.B., K.C.M.G., Sir A. George Hadcock, K.B.E., F.R.S., D.Sc., Mr. F. C. Yapp, Mr. J. Callander (General Manager of the Barrow Works and Naval Yard, Newcastle-on-Tyne), and Mr. J. Reid Young, C.A. (Secretary of Vickers Limited).

As from January 1, 1936, Commander Sir Charles Craven, R.N., will be Chairman of the English Steel Corporation Limited, in place of Colonel J. B. Neilson, C.M.G., D.S.O., C.A., and will retain his office as Managing Director. Mr. F. Pickworth will be a Director of the English Steel Corporation Limited from the same date.

The New Parliament

The following are some of the unopposed or successful candidates at the recent General Election, who are more or less closely connected or associated with railways:—

RAILWAY DIRECTORS

	Railway	Elected Member for
Mr. L. S. Amery ..	Southern	Birmingham, Sparkbrook (C.).
Sir A. G. Anderson ..	L.M.S.R.	City of London (C.).
Major J. J. Astor ..	G.W.R.	Kent, Dover (C.).
Sir Charles Barrie ..	L.N.E.R. and C.A.R.	Southampton (Lib. N.).
Sir A. Beit ..	Rhodesia	St. Pancras, S.E. (C.).
Lord Burghley ..	L.N.E.R.	Northants, Peterboro' (C.).
Major W. H. Carver ..	L.N.E.R.	E. Riding, Howdenshire (C.).
Sir G. Courthope ..	Southern	E. Sussex, Rye (C.).
Major Sir R. Glynn ..	L.M.S.R.	Abingdon (C.).
Sir Robert Horne ..	Chairman, G.W.R.	Glasgow, Hillhead (C.).
Mr. H. Macmillan ..	G.W.R.	Stockton-on-Tees (C.).
Mr. T. Somerset ..	L.M.S.R., N.C.C.	Belfast, N. (C.).
Sir J. S. Wardlaw-Milne	B.B. & C.I.R.	Kidderminster (C.).

RAILWAY AND ASSOCIATED UNIONS

	Union, &c.	Elected Member for
Mr. F. Anderson ..	R.C.A.	Whitehaven (La.).
Mr. H. C. Charleton ..	N.U.R.	Leeds, S. (La.).
Mr. W. Dobbie ..	N.U.R.	Rotherham (La.).
Mr. J. Henderson ..	N.U.R.	Manchester, Ardwick (La.).
Mr. A. Hills ..	N.U.R.	Pontefract (La.).
Mr. G. Lathan ..	R.C.A.	Sheffield, Park (La.).
Mr. G. Mathers ..	R.C.A.	Linlithgow (La.).
Mr. F. B. Simpson ..	R.C.A.	Ashton-under-Lyne (La.).
Mr. B. Smith ..	T.W.U. also L.T. Advisory Com.	Bermondsey, Rotherhithe (La.).
Mr. A. G. Walkden ..	R.C.A.	Bristol, S. (La.).
Mr. F. C. Watkins ..	R.C.A.	Hackney, Cen. (La.).

ASSOCIATED WITH RAILWAYS OR TRANSPORT

	Interests	Elected Member for
Lord Apsley ..	Former Parl. Pr. Sec. M. of T.	Bristol, Cen. (C.).
Mr. Stanley Baldwin ..	Former Director G.W.R.	Bewdley (C.).
Mr. H. L. Boyce ..	Ch. Gloucester C. & W. Co. Ltd.	Gloucester (C.).
Mr. P. G. T. Buchan Hepburn ..	Former Parl. Pr. Sec. M. of T.	E. Toxteth (C.).
Mr. R. A. Carey ..	Formerly of the Underground group	Eccles (C.).
Mr. A. E. L. Chorlton ..	Past Pres. Inst. Mech. Engineers	Bury (C.).
Mr. D. J. Colville ..	Sec. Dept. Overseas Trade	Midlothian (C.).
Sir Philip Dawson ..	Formerly Electrification Advisory Committee	Lewisham, W. (C.).
Viscount Elmley ..	Parl. Pr. Sec. M. of T.	Norfolk, E. (Lib. N.).
Mr. P. J. H. Hannon ..	Commercial and Transport	Birmingham, Moseley (C.).
Mr. L. Hore-Belisha ..	Minister of Transport	Devonport (Lib. N.).
Sir Henry Jackson ..	Various transport bodies	Wandsworth, Cen. (C.).
Sir F. Mills ..	Late Ch. Ebbw Vale Steel, Iron & Coal Co.	Leyton, E. (C.).
Lt.-Col. Moore-Brabazon ..	Former Parl. Sec. M. of T.	Wallasey (C.).
Mr. H. Morrison ..	Former Minister of Transport	Hackney, S. (La.).
Sir J. Nall ..	Coal, Transport and Electricity	Man., Hulme (C.).
Mr. L. F. Plugge ..	Formerly with Underground group	Rochester (C.).
Sir W. Preston ..	Dir., J. Stone & Co. Ltd.	Cheltenham (C.).
Sir E. Ramsden ..	Ch. U.K. Trade Mission to Poland (1934)	Bradford, N. (C.).
Mr. Oliver Stanley ..	Former Minister of Transport	Westmorland (C.).
Mr. G. R. Strauss ..	Former Parl. Pr. Sec. M. of T.	Lambeth, N. (La.).
Mr. J. H. Thomas ..	Former Gen. Sec. N.U.R.	Derby (N. La.).
Major G. C. Tryon ..	Postmaster General ..	Brighton (C.).
Mr. H. G. Williams ..	Dir. Inc. Assn. Electric Power Companies	Croydon, S. (C.).

November 22, 1935

Railway Students' Association Presidential Address

On Thursday, November 14 last, Lt.-Col. Gilbert S. Szlumper, Assistant General Manager, Southern Railway, delivered his Presidential address to the Railway Students' Association of the London School of Economics, London University. Sir William Beveridge, Director of the School and Retiring President, was in the chair. Col. Szlumper adopted the novel method of making the greater part of his address a description of an imaginary railway journey as taken by an ordinary fare-paying passenger, his object being to whet the appetites of his audience by suggesting some of the problems of the traveller.

The journey was preceded by the purchase of a timetable at a cost of 6d., and he wondered how many firms could afford to charge a potential customer for a catalogue of its goods. Moreover, the timetable necessitated a search for a magnifying glass in order to read its microscopic print. He became very troubled at the hieroglyphics called "notes" which seemed to occupy all the letters of the alphabet in various styles of printing.

He then presented himself at a well-known London station which was covered with the dirt of ages on every ledge and crevice. Being an anti-litter fiend, he sought in vain for a receptacle into which to put his empty cigarette carton. He then remembered some stations that other nations had been able to produce—Milan, Copenhagen, Washington, and many others which were a joy to look upon. There were signs, he had to admit, that at last we were finding out that it was not impossible to combine appearance and utility, but there was much that could be done to improve the dreadfulness of some of our stations without impairing the revenue from advertisements.

Of course, he was a little riled when he went to the dirty little dog kennel opening to buy his ticket. The journey was only the first of a series on the same railway, so he expected to be able to buy 300 miles of travel, letting the ticket collector remove a portion for each of the sections he covered. This, however, was impossible. Surely if a passenger bought travel, he asked himself, it belonged to him to do as he liked with? Moreover, why shouldn't he give away the return half if he wanted?

Next he found himself worried about baggage. He had been used to getting a check for it, which when handed to a porter at his destination resulted in his finding the luggage in his room within half an hour. Here, however, he had to see about it himself.

Unfortunately the train in which he travelled seemed to have lacked recent attention. No brush had been applied to its upholstery for some time, nor was its exterior as inviting as the buses he had seen running along the roads. He criticised much about that

train—its lavatories, its feeding, its speed and comfort. Then he inquired for some particulars about the locomotive, and was astounded to learn it had an efficiency of only about 7 per cent., and that owing to steam losses, and so on, only 7 work units were available at the rails for every 100 units put into the firebox. He hoped that some day some unorthodox locomotive engineer would set to work to design afresh his steam engine and arrive at a machine with a more creditable figure of efficiency; who would find some method of treating the feed water so as to obviate time lost in boiler cleanings.

The leisurely pace of the journey galled him, for he remembered the craze for speed and the way in which travellers were willing to pay high prices for air travel where that was better than land speed for the throughout journey. He knew, of course, that the spectacular dash of some trains had only the virtue of publicity, but he hoped that by the time the locomotive engineer had improved his machine, the civil engineer would have found some means of perfecting his roadbed and strengthening his bridges at a reasonable cost, and the traffic and signal departments would have put their heads together and re-signalled the line with some modern system and with revised sections so that, between them, the speed of all trains would be increased very appreciably.

Turning from this railway journey, Col. Szlumper then said that nobody knew better than he the necessity for keeping a check on the expenditure side of the account, but he believed many amenities could be introduced into railway travel without any loss of net revenue, and was sure that many improvements in efficiency could and should be made with satisfactory financial results.

He asked, for instance, whether it would not be wise to revise the stopping places of the majority of passenger trains, calling only at the more important towns some 25 or 30 miles apart, and coming to some arrangements with road associates to serve the intervening country and villages. Such a process would enable an increase in the average speed of lesser trains, and might form the basis of some bargain which would leave practically the whole of the long-distance traffic to the railways. Again, electrification experience on the Southern Railway had shown that frequency and regular intervals were assets that were difficult to overvalue.

Discussing branch line traffic, he suggested that a lower rate of fares might be made commercially possible by simplification of working methods. For instance, the driver or guard of the train unit on a branch line might carry a key with which they might operate the signals of the sections

ahead and behind. He found it difficult to see why road vehicles running over contact strips at cross-roads should have the monopoly of this form of signalling. Speaking of the container, Col. Szlumper said that he was not interested in containers until he was shown a design that could be handled anywhere without the intervention of a crane.

The question of rates was not altogether within the control of the railways, but they looked with envy on the parcels post without a classification, or on Carter Paterson & Co. which did not find it necessary to divide the goods it carried into 21 categories with innumerable exceptions. However, the day was apparently coming when the situation would be safeguarded and simplified, allowing for a cut in some of the expense attached to the present cumbersome arrangements.

In the air he saw some of the problems of the road reiterated, with the time factor replacing the door-to-door factor in the equation. So far as internal services were concerned this time factor would not give any trouble for some time to come, but on overseas services the matter might soon reach disturbing dimensions, and if the railways did not themselves become interested in such services, they would have to decide to what extent they should foster competition by acting as collection or delivery ancillaries, or by the provision of train services to rail-connected airports. To try to counter the tendency by an increase in the speed of cross-channel boats was out of the question. He thought, however, that there might be some reduction in irritating delays at the ports, and would, within reason, let a passenger do what he liked, when he liked, how he liked—making him pay such extra price for his foibles as to ensure he does not indulge in them to a sufficient extent to become a nuisance.

Golf : Eastern Command v. L.M.S.R.—A foursomes match between the officers of the Eastern Command and of the L.M.S.R., respectively, was played at the West Herts G.C. on Friday last, November 15, and resulted in a win for the Eastern Command by three matches to one. Details are as follow :—

EASTERN COMMAND

General Sir C. Deverell and R. H. L. Oulton (2 and 1) ...	1
Colonel J. C. Wickham and Brigadier H. N. North ...	0
Major M. A. Green and A. L. Semmence (3 and 2) ...	1
Major-General L. I. G. Morgan Owen and Brigadier R. P. Pakenham-Walsh (6 and 5) ...	1
Total	3

L.M.S.R.

Mr. E. J. H. Lemon and Mr. C. E. Fairburn	0
Mr. G. Morton and Mr. H. V. Mosley (4 and 3) ...	1
Mr. W. O. Davies and Mr. F. Smith	0
Mr. A. Eddy and Mr. A. F. Bound	0
Total	1

Railway Companies' Officers at Motor Manufacturers' Luncheon

Representatives of the British railway companies, and of the Furniture Warehousemen and Removers' Association, were the guests of the Society of Motor Manufacturers and Traders at a luncheon held at Olympia on November 14, as briefly recorded in our news columns last week.

Sir George Beharrell, who presided, proposed the toast of the guests, and said that in view of his long association with the railways he was particularly pleased to have the opportunity of seeing so many old friends. It was also gratifying that so many representatives of two great industries had resisted the enormous counter-appeal of a General Election in order to attend, even though it was to be feared that some had foregone the fulfilment of their civic duties in order to do so.

Discussing the progress of the motor trade as represented at the Commercial Vehicle Exhibition at Olympia, he said that the industry had continued to expand in spite of many difficulties and close legislative control, and he was sure of agreement when he claimed that it had very materially assisted in the industrial recovery of this country. They all knew what an important part it had played in enabling large numbers of people to find honourable employment, and to live in decent surroundings.

The industry was admittedly a great customer of the railway companies, particularly if the component parts of a motor vehicle were traced back to its raw materials. The coal, iron, and steel industries owed a great deal to this development, and a very considerable amount of freight accrued to the railway companies out of the construction of these vehicles.

A change in the purchasing habits of the present century, due to the desire of traders and shopkeepers to work on a minimum stock, had resulted in goods being forwarded in much smaller individual consignments than formerly—or, in other words, in a great increase in what railwaymen knew as l.c.l. lots. He thought that the railway representatives present would agree that terminal facilities would be quite unable to cope with such business, were there no road transport. "Rail and road" he continued, "are here to serve the public. Neither can now exist without the other, and I am sure we shall all come to recognise this. My old chief, Sir George Gibb (whose son I am pleased to see with us today) once said 'a sign of a great man is that he acquiesces in established facts gracefully.' Let us try to be big and acquiesce graciously."

The railways now derived a net revenue of £600,000—representing a large sum of gross earnings—from the road interests which they had acquired. Sir George wished equal success to

their incursions into the air, and was sure that in time accumulating experience would evolve closer co-operation between the three forms of transport, with justice to all.

With the toast was coupled the name of Mr. E. J. H. Lemon, a Vice-President, L.M.S.R., who had a great reputation in the railway world and outside it. Sir George also welcomed Mr. Bishop, President of the Furniture Warehousemen and Removers' Association, who had not only himself a life-long association with the trade, but was the successor to the third generation engaged in it.

Mr. E. J. H. Lemon, replying to the toast, congratulated the motor manufacturers on the initiative, ingenuity, and variety put into the design and manufacture of the vehicles. He had noticed, however, that they were introducing the streamlining of commercial motor vehicles, and he wondered whether in following an absurd fashion adopted in the United States—where they were even streamlining refrigerators—they were not working on wrong lines. He could see no advantage in streamlining a commercial vehicle which was limited to a speed of 30 m.p.h.; no great benefits could be obtained until speeds of over 60 m.p.h. were reached.

He urged that there should be more co-operation between road and rail transport. Both were providing essential public services, and so far as the railways were concerned, they would not complain provided they were working under conditions of equality as to public regulation. The railways were

prepared to play fair, but it had got to be fair. In this connection he mentioned that Mr. C. le M. Gosselin, in the course of an address to the Commercial Motor Users' Association on November 13, had referred somewhat critically to the railway companies' accounts. He wished to point out, first, that the accounts were statutory accounts, and, secondly, that their chairman at the luncheon, Sir George Beharrell, was himself one of the people responsible for the form in which railway accounts were prepared.

He wished to emphasise that the railways were the motor manufacturers' biggest customers, and they, in turn, were important customers of the railways. He was recently looking at some American figures of steel output, where it was stated that 50 per cent. was taken by the motor industry. He had no comparable figure for Great Britain, but it must be high, and that steel was carried by the railways. There ought, therefore, to be no real enmity between them.

In conclusion, he referred them to a speech he had made at the Commercial Motor Exhibition in 1933, when he pointed out that the manufacturers had gone wrong with regard to the development of the mechanical horse; they had started with a unit to replace the horse, but had developed a unit which was replacing two-ton or three-ton lorries. He had then suggested that chassis should be designed so that it would be a simple matter to replace any unit when the improvements effected warranted that replacement, in order that a vehicle should not be rendered obsolete by reason of great improvement in any one unit of it. So far, he said, no progress had been made by the manufacturers in the directions he had outlined.

Road Motor Vehicles for Railway Work

The usual conference arranged by the Railway Companies' Association in connection with the Commercial Motor Transport Exhibition, took place at Olympia on Thursday, November 14; the chair was taken by Mr. W. H. Gaunt, President, Mansion House Association on Transport. For this occasion the debate was opened by the submission of a resolution "That the present day motor manufacturers have not yet generally recognised the importance of the short-distance haulier and his special requirements." In opening the discussion, Mr. F. C. A. Coventry (Superintendent of Road Transport, G.W.R.) said that on several previous occasions he and other speakers had put forward the various requirements of the short-distance haulier, but an inspection of the exhibition showed that, with some few exceptional cases, the points had not been incorporated in designs. The improvements appeared to be all in favour of the long-distance haulier. He defined

the short distance man as one doing about 30 miles a day, or about 9,000 miles a year. That was more than the railways could do, for in the 2-ton class, the G.W.R. with its fleet of 2,000 vehicles could do only 24.72 miles a day. That meant, taking the reasonable life of a vehicle as 150,000 miles, that it would take 16½ years to complete it. It might be said that doing only 30 miles a day was not using the vehicle to the best advantage. On general deliveries it could be taken that three minutes a call was a reasonable figure, when it is remembered that the driver has to find a place to pull in, stop the vehicle, get out, find the customer, deliver the parcel, get a signature, get back in the car, and start it up. Taking 130 calls at 3 min. each, the total is 6½ hr., while 30 miles at 15 m.p.h. gives 2 hr., and that accounts for the man's 8½ hr. work. Mr. Coventry also mentioned the sugar beet traffic and said that the terminal time for a 5-ton load would be 2 hr., so with

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three trips a day that would total 6 hr., leaving only a couple of hours for running time.

With regard to the requirements of the short distance haulier, Mr. Coventry said the first must be low cost. He expressed the opinion that some of the electrical equipment on these vehicles was not really suitable. Starters would not stand up to 200 starts a day, and the batteries could not cope with it. He had found it necessary to give up direct charging of batteries and return to the old system of charging at night. He thought also that it might be found possible to produce a more suitable tyre for this short distance work which would last for two or three years, as compared with the long distance tyres which could be used up in a few months.

The discussion was continued with various speakers alternately speaking for the railway companies and the motor manufacturers, and among those taking part were:—

Mr. L. Pomeroy (Daimler Co. Ltd.); Mr. C. R. Byrom, O.B.E. (Chief Operating Manager, L.M.S.R.); Dr. H. F. Howarth (Leyland Motors Limited); Mr. J. Shearman (Road Motor Engineer, L.M.S.R.); Mr. J. B. Osler (Express Motor & Body Works Limited); Mr. W. Guy Jones (Road Motor Engineer, Southern and North Eastern Areas, L.N.E.R.); Mr. S. O. Smith (John I. Thornycroft & Co. Ltd.); Mr. A. R. Wilson (Cartage Manager, Southern Area, L.N.E.R.); Mr. J. B. Keep (Commer Cars Limited, and Karrier Motors Limited); Lt.-Col. A. G. Scammell (Scammell Lorries Limited); and Mr. Parsons (Dunlop Rubber Co. Ltd.).

For the railway side it was contended that what was required was a simple machine with nothing very much in the way of what might be termed refinements. It was even suggested that an air-cooled engine might be used, and that two cylinders might suffice. Owing to the short runs between calls it was difficult to get the engine warm enough and there was the trouble due to fuel dilution in the base chamber, and because of that cylinder wear was heavy. There was a plea for simpler petrol feed and for an automatic means of switching off the coil when the engine stopped. Another point made was that as the vehicle was seldom required to reach 30 m.p.h., a simpler form of gearbox could be used, and one speaker advocated a return to the cone clutch. Several speakers also stressed the necessity of getting easier access to the driver's cab in view of the constant getting in and out. Mr. Guy Jones pointed out that while progress had been made in reducing the unladen weight of the 4-ton machine, it was not seen in the smaller class. A 4-ton machine with an unladen weight of $3\frac{1}{2}$ tons had an engine capacity ratio to the gross unladen weight of approximately 500 c.c. per gross ton, whereas the $1\frac{1}{2}$ -ton machines had a ratio of 900 c.c. per gross ton.

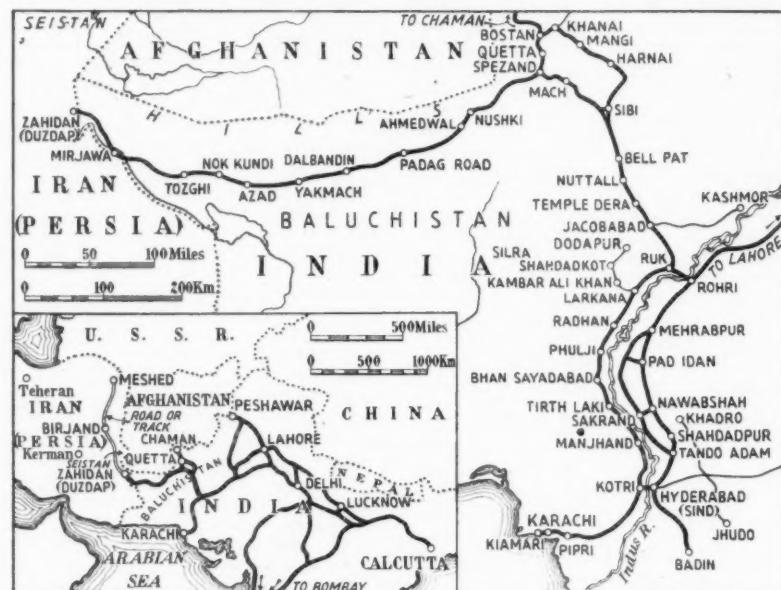
Several speakers on the motor manufacturing side pointed out that the suggested price of £100 could not be attained owing to the small number of vehicles that were likely to be ordered by the railway companies. It was

emphasised, however, that there were other potential users of a special vehicle for short distance work, as shown by the fact that of the 20,000 horse-drawn vehicles in London, only 4,000 were owned by the railways.

In winding up the discussion, the chairman said that it had to be kept

in mind that the driver of these vehicles was a dual-purpose man. He had to be a canvasser and have a certain amount of commercial ability, but they could not expect that they would all be first class motor drivers. That was why the machine for collection and delivery must be as simple as possible.

The Indo-Iranian Railway



At Delhi, Mirza Seyyid Kazami, a Minister from Iran (Persia) is just now the guest of the Government of India, and his visit, according to *The Times*, is closely connected with the improvement of Indo-Iranian trade. With this subject is bound up the question of reopening the extreme westerly section of the Quetta-Duzdap branch of the North Western Railway, a section about 150 miles in length closed in 1932. Originally a strategic line some 400 odd miles in length, this branch was kept open after the war period as there was a certain amount of trade between Eastern Persia and India. Eventually, however, the working of the section west of Nok Kundi did not warrant the running of even two trains a week, and so was closed.

As may be seen from the sketch map above, this branch for almost the whole of its 400-mile length traverses Tribal Baluchistan and skirts the southern frontier of Afghanistan, terminating—as constructed and as still laid—near the important junction of that frontier with the Indo-Iranian and Iran-Afghan frontiers. It runs through practically unbroken *dash*, or stony desert, but some 70 or 80 miles north of Duzdap there is a wide oasis bordering the Hamun (Lake)-i-Helmand and known as Seistan, a fertile area that might be developed were the railway extended to it. This extension is

another subject which is almost certain to be discussed at Delhi, and is the complement of the putting in order and reopening of the Nok Kundi-Duzdap section. The other alternative is to extend this line westwards as mentioned in the Trans-Iranian Railway article published in our issue of July 26 last, and so link up with the north-south Iranian railway and the proposed extensions into Turkey and Iraq. The Seistan line might also be extended to Meshed, an important city farther north, but all these extensions would be in Iranian territory, and would not directly concern the Government of India, as would the reopening of the N.W.R. beyond Nok Kundi. An editorial article on this subject will be found on page 862.

HULL PARAGON STATION.—The L.N.E.R. is about to carry out a scheme of improvements to the Hull Paragon station booking and enquiry offices. At the present time the two offices are in different parts of the station premises. It is proposed to open out the booking office on the platform side and to extend the building so as to afford accommodation for the provision of a combined booking and enquiry office. The new enquiry office will have an all-glass front, and access to it will be from the main platform.

RAILWAY AND OTHER MEETINGS

Bengal-Nagpur Railway Co. Ltd.

The 77th ordinary general meeting of the Bengal-Nagpur Railway Co. Ltd., was held on November 14, at Gresham House, E.C., Sir Trevredyn Wynne, K.C.S.I., K.C.I.E. (Chairman and Managing Director), presiding.

The Chairman said that the gross earnings for the year 1934-35 were 56 lakhs more than those for the preceding year, and he felt justified in thinking that receipts for the year 1935-36 would be higher than for 1934-35, as up to date there was an increase of 35 lakhs compared with the same period last year. About two-thirds of their traffic consisted of coal, minerals, and raw products required by the Tata Iron & Steel Company, the Indian Iron and Steel Company, and the Bengal Iron Company. The works of these companies, and the source of supply of their raw materials, were situated on this railway. The total tonnage carried for these companies during the year 1934-35 was ten million tons, an increase over tonnage carried in 1933-34. Apart from mineral traffic, there was an increase in general goods, due to the activities of the commercial department and in part to the recently-constructed extension from Raipur to the south-east, which connected the main system and Central India with the Port of Vizagapatam. This extension had opened out an area of 125,000 square miles of country which previously had no railway facilities.

The rates charged for the carriage of goods on Indian railways were governed by the classification of every kind of goods traffic. To each class there was a maximum and minimum rate between which a rate might be quoted. A committee was appointed a year ago to examine the existing classification and improve it. This committee had now advised that the number of classifications should be increased to 16 classes, an increase of six more than the existing classification, but the maximum and minimum of each class was still maintained, and any reduction below the minimum of any class could not be quoted without first obtaining the sanction of the Railway Board, which involved delay. This did not help to increase traffic, and the main complaint of the public was the general inability to obtain from a railway the quotation of a firm rate expeditiously and without inordinate delay. It seemed to him that classification and maximum and minimum rates on each Indian railway for all traffic on its own system should be abandoned, and rates that would induce increased traffic and help to develop new trade should be allowed to be quoted. The question of rates to competitive ports, and of traffic passing over two or more systems, required most careful consideration, as the present practice resulted in creating

competitive rates and unnecessary loss of revenue.

Regarding administration, a tendency to increase centralisation had become manifest of recent years. The Railway Board was created in 1905 and consisted of three members and a very small office. Each railway was a community, the members of which were interested in working their railway economically and endeavouring to make it pay its way. The present Railway Board was much more elaborate, consisting of a

Chief Commissioner, four commissioners, six directors, and a largely increased office and statistical staff. Correspondence with the railways had vastly increased in consequence. There was further the exercise of pressure by the Legislative Assembly in many matters of administration, and orders were apt to issue from the Railway Board, applicable to all railways in India, irrespective of the different conditions under which each railway had to work. He could not help feeling that this was a retrograde step, and contrary to the recommendations made in 1922-23 by the Indian Retrenchment (Inchape) Committee.

The report was adopted.

Entre Rios Railways Co. Ltd.

The ordinary general meeting of the Entre Rios Railways Co. Ltd., was held at River Plate House, Finsbury Circus, E.C.2, on Monday, November 18, Sir Follett Holt, K.B.E. (Chairman of the company), presiding.

The Chairman said that the results of operating the line were much better than those for either of the two previous years, when the ravages of locusts and road competition, added to exchange losses, combined to diminish so severely its earning power. The net receipts, however, still fell far short of what was required to put the affairs of the company again on a sound footing. After deducting exchange losses the balance only amounted to £101,248, whereas to meet debenture and preference charges an amount of £329,562 was required. Five years ago this sum was more than covered, and although the volume of traffic dealt with as measured in ton-mileage was only 15 per cent. less in the past twelve months than at that time, the lowering of rates to meet road competition and loss in exchange had served to reduce revenue by 72 per cent. Unfortunately, the exchange position still remained most difficult and the rate had been very low throughout the past year. Remittances received at an average of \$17.10 to the £ against the par rate of \$11.45 involved a realised loss of £49,427, which together with the provision of £35,610 for other ex-

change differences gave a total of £85,037, equivalent to 46 per cent. of the net receipts of the line taken at par.

The greatly needed law to co-ordinate all forms of transport in Argentina had been approved by the Deputies but was not considered by the Senate before Congress closed. Moreover, the draft law in its passage through the House of Deputies was amended in such a way as largely to destroy the objects for which it was designed. The railways had still to compete, therefore, under most unfair conditions with road vehicles.

Outside of actual legislation a great deal could be done to help through further friendly executive action. As examples, he would instance the regulation of the competition of the Provincial and State Government railways, tariff adjustments to meet modern needs, special consideration in exchange, relief from carrying in full the burden of employees not required, and the relaxation from the perhaps over-meticulous Government control that had crept into railway affairs. These were all ordinary business matters, and with the presence in Argentina of three of the leading representatives from London, all skilled railwaymen with intimate local knowledge, the opportunity existed for dealing effectively with these subjects.

The report was adopted.

Exports of Railway Material from the U.K. in October

					Ten Months Ending
		Oct., 1935	Oct., 1934	Oct., 1935	Oct., 1934
Locomotives, rail	81,436	27,678	609,040
Carriages and wagons	114,243	78,105	989,926
Rails, steel	86,708	74,570	743,337
Wheels, sleepers, fishplates and miscellaneous materials	183,551	114,250	1,601,277
					989,315

Locomotive and rail exports included the following :—

		Locomotives		Rails	
		Oct., 1935	Oct., 1934	Oct., 1935	Oct., 1934
Argentina	—	4,112	6,851
Union of South Africa	—	90,341	55,872
British India	10,746	1,040	75,957
					31,621

November 22, 1935

NOTES AND NEWS

Streamlined Trains for the C.P.R.

—The Canadian Pacific Railway has ordered from the Montreal Locomotive Works five streamlined 4-4-4 type locomotives to be used with special light-weight trains.

New Southern Suburban Station.

—Falconwood, the new Southern Railway station being built between Eltham Park and Wellings, on the suburban electric line to Dartford via Bexleyheath, will be opened on January 1 next.

Gatwick Airport Station.—The new Southern Railway station recently built between Horley and Three Bridges (of which we published some illustrations on page 836 of last week's issue) is to be known as "Gatwick Airport" instead of "Tinsley Green for Gatwick Airport."

Spanish Locomotive Rebuild.—The Norte Railway, of Spain, is rebuilding one of its four-cylinder compound Mountain locomotives in accordance with the principles evolved by M. André Chapelon, and applied to the P.O.-Midi 4-6-2 and 4-8-0 rebuilds. It is expected that in the modified condition the Norte 4-8-2 engine will be able to develop over 4,000 indicated h.p.

Standardisation of Signalling Methods and Practice.—The Institution of Railway Signal Engineers spent a very useful evening on Wednesday last, November 20, when a discussion on the above subject took place. The President (Mr. H. E. Morgan) was in the chair, and after Major R. Falshaw Morkill had opened the discussion, the following took part in the proceedings: the President; Messrs. T. T. Eldridge, H. M. Proud, W. Hammond, F. R. Addis, W. H. Hayles, H. H. Dyer, W. S. Every, L. H. Peter, F. B. Eggington, Singh, W. R. Jones, W. Lang, P. A. Langley, and W. S. Roberts. Major Morkill briefly replied to some of the points raised in a very interesting discussion.

The Brighter Station Movement on the L.N.E.R.—During 1936 the L.N.E.R. plans to repaint 354 passenger stations and depots together with adjoining signal boxes and offices. In continuance of its policy of introducing special schemes of colour decoration, certain stations have been selected where it is considered such treatment is particularly applicable and can be advantageously adopted. Among stations selected for distinctive painting in brighter colours during next year are Chesterfield, Colchester, Leicester, Ely, Frinton, Felixstowe, Lowestoft, Dinsdale, Eaglescliffe, Thornaby, Middlebrough, Ripon, Hornsea Bridge, and Hornsea. A further development to be introduced is the painting of all stations on any particular branch in the same distinctive colours. Special decorative schemes are being prepared in this connection for the stations on the following branches: Newcastle to Car-

lisle and Alston; York to Harrogate; and Scarborough to Whitby. The Riverside branch on Tyneside is to be redecorated on similar lines to that already adopted for stations on the Newcastle electrified lines.

New Pacific Locomotives for South Africa.—We understand that the soot blowers fitted to the new Henschel Pacific locomotives of Class 16E for the South African Railways, illustrated and described in THE RAILWAY GAZETTE last week, were supplied by Clyde Blowers Limited, of Glasgow.

U.S.S.R. Locomotive Building.

According to a Reuters message from Moscow, progress at the various locomotive building shops is keeping abreast of the programme, 78 per cent. of the 1,469 engines scheduled to be turned out this year having already been completed. The number so far built this year is also stated to be 40 per cent. higher than in the corresponding period in 1934, and it is anticipated that the whole output for 1935 will be double that in 1933.

Institute of British Executives.

In our issue of August 2 we referred to the wider activities now undertaken by this institute in its work as an employment centre for men seeking executive posts. The institute is now seeking the support of employers to assist it in pursuing its work not only of supplying qualified men for executive positions, but of helping those who lose their employment through business re-organisation. It is, therefore, desired to enrol employers as corporate members of the institute at a nominal fee of two guineas a year, in order to provide income for developing a work which concerns the welfare of executive men generally, both in and out of employment. The Secretary is Mr. Guy F. Dowding, A.M.I.Mech.E., Swan House, 153, Oxford Street, W.1.

Southern Railway Rating Appeal.

—The House of Lords began, on November 18, the hearing of the appeals by the Railway Assessment Authority, the London and Middlesex County Councils, and the boroughs of Brighton and Croydon against the decision of the Railway and Canal Commission, under which the rating assessment of the Southern Railway Company's undertaking was reduced from £2,180,000 (the figure fixed by the Authority) to £1,077,131. The local authorities contended that the figure should have been £3,000,000. Proceedings opened with the address of Sir William Jowitt, K.C., for the Assessment Authority, and his address lasted over Tuesday, when the hearing was adjourned until yesterday (Thursday). He contended that the Railway and Canal Commission was wrong in holding that the Act of 1930 was not intended to introduce a new method of valuing railway hereditaments for rating purposes, but was intended to perpetuate the profits basis. Section 4 (2) of the Act laid down that the assessment

authority should not be bound to give effect to any previous custom or practice affecting the valuation of railway hereditaments, but should have regard to all relevant circumstances.

Scottish Station to be Rebuilt.

—The L.N.E.R. is about to remodel Hamilton station in Lanarkshire. The large roof spanning the station buildings, platform, and platform line is to be replaced by a veranda, which will cover half the width of the platform and extend the length of the station buildings. With a view to dealing more satisfactorily with parcels traffic and passengers' luggage, the loading bank at the station is to be extended and provided with a canopy. The existing gas illumination is being substituted by electric light.

A George Hudson Broadcast.

The first of a new series of broadcasts, called "Northern Portrait Gallery," was given from the Northern station of the B.C.C. on November 18. The talks are taking the form of potted biographies of eminent Northeners, and the first portrait was that of George Hudson, the Railway King. The speaker was Mr. Richard S. Lambert, Editor of *The Listener* and author of the life of Hudson published not long ago and reviewed in our issue of November 9, 1934. This interesting broadcast is reproduced in the current issue of *The Listener*.

The Transandine Railway Problem.

—In his address to the shareholders at the annual general meeting of the Argentine Transandine Railway Company on November 14, Mr. J. A. Goudge, referring to the portion of the line which suffered so heavily in the avalanche of January, 1934, said it had been shown by surveys and re-surveys that an improved line could be constructed which would remain at a level well above that reached by the water in 1934. But the magnitude of the catastrophe prevented this company from even considering any step towards reconstruction. The Chilean and Argentine Governments could, of course, keep both sections of the line open and working even at a loss, but this involved either the ownership of the lines or the payment of a guaranteed interest. A joint commission of the two republics now had the whole question under discussion, and during his forthcoming stay in Argentina some further developments might occur.

Welsh Inter-Railway Competition.

—The twelfth annual competition for the possession of the "Harry Webb" Cup, the Welsh Inter-railway ambulance trophy, was held in the City Hall, Cardiff, on November 6, and attracted a large number of interested spectators. Five teams competed, three from the L.M.S.R. and two from the G.W.R. The adjudicators were Dr. C. A. Bence, Cardiff (team work), Dr. S. MacCormac, Newport (individual test), and Dr. H. B. Pierce, Mountain Ash (Practical individual work). The team test, which represented a railway accident, two patients requiring attention, gave scope for some discriminating treatment by the

competitors. Among the large company present were :—

Alderman G. Hill Snook; Mr. J. F. Lean, Principal Assistant to the General Manager, G.W.R.; Mr. C. H. Tait, District Goods and Passenger Manager, L.M.S.R., Swansea; Mr. W. E. Baines, Divisional Locomotive Superintendent, G.W.R., Newport; Mr. N. L. Wallis, District Engineer, L.M.S.R., Abergavenny; Mr. T. Storey, District Assistant, L.M.S.R., Abergavenny; Mr. A. W. Hamer, Assistant District Manager, L.M.S.R., Swansea; Mr. G. D. S. Alley, Assistant District Engineer, L.M.S.R., Abergavenny; Miss C. A. Ault, Ambulance Centre Secretary, G.W.R., Paddington; Mrs. John H. Bruce; and officials of the St. John Ambulance Brigade.

The Hon. John Bruce, Principal Secretary of the Priory for Wales, who presided over the subsequent presentation proceedings, referred to the fact that over 3,400 railway employees passed their first-aid examinations annually in the Principality, and were a source of considerable strength to the ambulance movement. He announced the result of the competition as under :—

	Total.
1. Fishguard Harbour, G.W.R.	270½
2. Knighton, L.M.S.R.	268½
3. Newport Docks, G.W.R.	268½
4. Ruthin, L.M.S.R.	251½
5. Abergavenny...	248

The presentation of the cup and individual prizes to the Fishguard Harbour team was made by Mr. Lean, while Mr. Tait presented prizes to the Knighton team, who were adjudged runners-up, having gained higher marks than Newport Docks in the individual part of the tests. The judges were thanked for their services on the motion of Mr. Lean.

Road Accidents.—The Ministry of Transport return for the week ended November 16 of persons killed or injured in road accidents is as follows. The figures in brackets are those for the corresponding period of last year :—

	Killed, including deaths resulting from previous accidents	Injured
England	... 145 (119)	3,823 (3,400)
Wales	... 2 (5)	150 (143)
Scotland	... 18 (16)	326 (352)
	165 (140)	4,299 (3,895)

The total fatalities for the previous week were 133, as compared with 143 for the corresponding period of last year.

British and Irish Traffic Returns

GREAT BRITAIN	Totals for 46th Week			Totals to Date		
	1935	1934	Inc. or Dec.	1935	1934	Inc. or Dec.
L.M.S.R. (6,924½ mls.)						
Passenger-train traffic...	£75,000	£86,000	— 11,000	22,437,000	22,053,000	+ 384,000
Merchandise, &c.	491,000	477,000	+ 14,000	20,721,000	20,544,000	+ 177,000
Coal and coke	268,000	262,000	+ 6,000	10,518,000	10,414,000	+ 104,000
Goods-train traffic	759,000	739,000	+ 20,000	31,239,000	30,958,000	+ 281,000
Total receipts ...	1,134,000	1,125,000	+ 9,000	53,676,000	53,011,000	+ 665,000
L.N.E.R. (6,336 mls.)					*	
Passenger-train traffic...	259,000	258,000	+ 1,000	14,652,000	14,344,000	+ 308,000
Merchandise, &c.	350,000	348,000	+ 2,000	14,409,000	14,466,000	— 57,000
Coal and coke	265,000	250,000	+ 15,000	10,261,000	10,409,000	— 148,000
Goods-train traffic	615,000	598,000	+ 17,000	24,670,000	24,875,000	— 205,000
Total receipts ...	874,000	856,000	+ 18,000	39,322,000	39,219,000	+ 103,000
G.W.R. (3,749½ mls.)						
Passenger-train traffic...	156,000	160,000	— 4,000	9,504,000	9,372,000	+ 132,000
Merchandise, &c.	192,000	188,000	+ 4,000	8,365,000	8,280,000	+ 85,000
Coal and coke	114,000	106,000	+ 8,000	4,546,000	4,574,000	— 28,000
Goods-train traffic	306,000	294,000	+ 12,000	12,911,000	12,854,000	+ 57,000
Total receipts ...	462,000	454,000	+ 8,000	22,415,000	22,226,000	+ 189,000
S.R. (2,171 mls.)						
Passenger-train traffic...	242,000	238,000	+ 4,000	13,916,000	13,523,000	+ 393,000
Merchandise, &c.	61,000	64,000	— 3,000	2,819,000	2,987,000	— 168,000
Coal and coke	33,000	33,000	—	1,361,000	1,401,000	— 40,000
Goods-train traffic	94,000	97,000	— 3,000	4,180,000	4,388,000	— 208,000
Total receipts ...	336,000	335,000	+ 1,000	18,996,000	17,911,000	+ 185,000
Liverpool Overhead ... (6½ mls.)	1,081	1,074	+ 7	54,334	52,411	+ 1,923
Mersey (4½ mls.) ...	4,075	4,246	— 171	185,062	187,434	— 2,372
*London Passenger Transport Board ...	547,800	535,500	+ 12,300	10,885,400	10,694,400	+ 191,000
IRELAND						
Belfast & C.D. pass. (80 mls.)	1,731	1,699	+ 32	118,169	116,866	+ 1,303
" " goods	601	483	+ 118	23,597	23,841	— 244
" " total	2,332	2,182	+ 150	141,766	140,707	+ 1,059
Great Northern pass. (543 mls.)	7,850	7,600	+ 250	489,350	465,700	+ 23,650
" " goods	10,400	9,950	+ 450	430,650	404,600	+ 26,050
" " total	18,250	17,550	+ 700	920,000	870,300	+ 49,700
Great Southern pass. (2,124 mls.)	18,267	18,530	— 263	1,140,749	1,113,108	+ 27,641
" " goods	44,313	40,785	+ 3,528	1,630,035	1,522,566	+ 107,469
" " total	62,580	59,315	+ 3,265	2,770,784	2,635,674	+ 135,110
G. SOUTHERN (IRELAND) Ord.	93½	41½	16	15	—	
L.P.T.B.						
4½% "A" ...	126	115	122½	+ 2		
5% "A" ...	135½	124½	132½	+ 1		
4½% "T.F.A." ...	113½	107½	109	—		
5½% "B" ...	131½	118	128½	+ 1		
"C" ...	97	73	106	+ 2		
MERSEY						
Ord.	151½	7	20	+ 2		
4% Perp. Deb.	93½	82½	95½	—		
3% Perp. Deb.	66½	61½	75	—		
3% Perp. Prefee.	54	44½	56½	+ 2		

* 20th week, the receipts for which include those undertakings not absorbed by the L.P.T.B. in the corresponding period last year; last year's figures are, however, adjusted for comparative purposes.

British and Irish Railways Stocks and Shares

Stocks	Highest 1934	Lowest 1934	Prices	
			Nov. 20, 1935	Rise/ Fall
G.W.R.				
Cons. Ord.	66½	48½	49	+ 1½
5% Con. Prefee.	118	109	117½	+ 2
5% Red. Pref. (1950)	115	107	109½	+ 1
4% Deb.	117	105	112	+ 1
4½% Deb.	119	109	113½	+ 1
4½% Deb.	129½	115½	121½	+ 1
5% Deb.	135	126½	135½	+ 2
2½% Deb.	75	64	71½	+ 1½
5% Rt. Charge	1347½	123½	132½	+ 2
5% Cons. Guar.	132½	121½	128½	+ 1
L.M.S.R.				
Ord.	30½	19½	17½	- 1½
4% Prefee. (1923)	64½	41	52	+ 1½
4% Prefee.	87	69½	82	+ 1½
5% Red. Pref. (1955)	107	92½	102½	+ 2
4% Deb.	114½	100½	109	+ 2
5% Red. Deb. (1952)	118½	111½	112½	—
4% Guar.	106½	96½	103	+ 2
L.N.E.R.				
5% Pref. Ord.	24½	13½	10	—
Def. Ord.	11½	6½	5½	—
4% First Prefee.	76	59½	57	—
4% Second Prefee.	47	25½	21	+ 1½
5% Red. Pref. (1955)	94½	80	77½	+ 3
4% First Guar.	104	92	99	+ 2
4% Second Guar.	97½	86½	90	+ 2½
3% Deb.	90	74½	82	+ 2
4% Deb.	114	99½	107	+ 2
5% Red. Deb. (1947)	117	108	109½	—
4½% Sinking Fund Red. Deb.	111½	105½	109	—
SOUTHERN				
Pref. Ord.	90	63½	82	—
Def. Ord.	32½	19	20½	+ 1½
5% Prefee.	118½	107½	117½	+ 2
5% Red. Pref. (1964)	115½	107½	113½	+ 1
5% Guar. Prefee.	132	120½	128½	+ 1
5% Red. Guar. Pref. (1957)	119½	113	115½	—
4% Deb.	116½	103½	111	+ 1
5% Deb.	134	124½	133½	—
4% Red. Deb. (1962-67)	113½	105½	110½	—
BELFAST & C.D.				
Ord.	6	5	8½	—
FORTH BRIDGE				
4% Deb.	110	100	105½	—
4% Guar.	110	100	104½	—
G. NORTHERN (IRELAND)				
Ord.	93½	41½	15	—
G. SOUTHERN (IRELAND)				
Ord.	25	12½	34	+ 1
Prefee.	21½	13½	44½	+ 1½
Guar.	48	39	82	+ 2½
Deb.	67	59	85½	+ 3½
L.P.T.B.				
4½% "A" ...	126	115	122½	+ 2
5% "A" ...	135½	124½	132½	+ 1
4½% "T.F.A." ...	113½	107½	109	—
5½% "B" ...	131½	118	128½	+ 1
"C" ...	97	73	106	+ 2
MERSEY				
Ord.	151½	7	20	+ 2
4% Perp. Deb.	93½	82½	95½	—
3% Perp. Deb.	66½	61½	75	—
3% Perp. Prefee.	54	44½	56½	+ 2

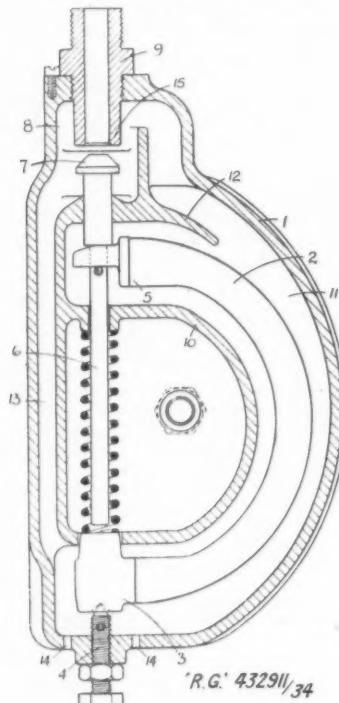
November 22, 1935

ABSTRACTS OF RECENT PATENTS*

No. 432,911. Steam Traps

Thomas Barty, of 82, York Road, King's Cross, London, N.1, and The Westinghouse Brake & Saxby Signal Co. Ltd., of the same address. February 6, 1934.

A steam trap for steam heating systems comprises a chamber of relatively small capacity containing a thermostatic element adapted to control the operation of a valve, establishing communication between the



steam pipe and the atmosphere, in which, only the steam entering the casing of the device when the valve is opened is arranged to be directed into immediate contact with the thermostatic element. The water of condensation is separately diverted to an outlet at the base of the chamber. A casing 1 contains a thermostatic element 2, one end 3 of which is supported by an adjusting screw 4 passing through the lower end of the casing. The other end 5 of the element is connected to the stem 6, of a poppet valve 7, which controls communication between the steam pipe and the chamber 8, the steam pipe being connected to a tubular plug 9 screwed into the casing. An internal partition 10 constitutes the inner wall of a chamber 11 in which the thermostatic element 2 is located, the chamber 11 thus surrounding the thermostatic element through its whole

length. A projecting lip, or guide member 12 directs steam from the chamber 8, into the chamber 11, bringing it into contact with the thermostatic element 2. A vertical passage 13 connects chamber 8 with the lower end of the chamber 11, wherein suitable vent ports 14 for the escape of the water of condensation are provided. Assuming the valve 7 to be closed, the casing 1 and the thermostatic element 2 are gradually cooled until the latter withdraws the valve 7 from its seat 15 formed on the lower end of the plug 9. The water of condensation can flow from the steam pipe to chamber 8, via passage 13, and out through the vent ports to the atmosphere, without coming into contact with the thermostatic element. As soon as the water from the steam pipe has been fully discharged, steam will pass into chamber 11 and by means of lip 12 will be directed on to the thermostatic element and thereby raise its temperature. Since chamber 11 is of relatively small capacity, a small amount of steam will be necessary to effect a rapid change of temperature in the element; and in so doing it will close the valve 7. An adjustment is effected by means of the screw 4, which enables the position of the lower end of the thermostatic element to be varied as required.—(Accepted August 6, 1935.)

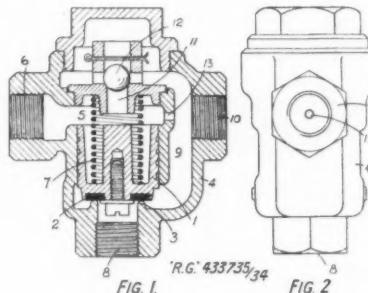
No. 433,735. Fluid Pressure Braking Apparatus

Norman Geoffrey Cadman, and the Westinghouse Brake and Saxby Signal Company Limited, both of 82, York Road, King's Cross, London, N.1. March 23, 1934.

A quick release valve device for fluid pressure braking apparatus, comprising a quick release valve element and a by-pass passage in which is situated a non-return valve element permitting the supply of fluid only to the brake cylinder. The quick release valve is influenced on the one hand by the brake cylinder pressure, and on the other hand by the fluid supply pressure under control of the driver's brake valve. It is normally held seated by means of a light spring. The device comprises a release valve element 1, with a seat member 2, resting on valve seat 3, provided in the casing 4. The upper surface of the piston is subjected to the fluid pressure in the chamber 5 connected through a port 6 to the driver's brake valve. Under normal conditions the release valve element is held seated by a light spring 7, such that the inner seated area of the piston is subjected to atmospheric pressure through the port 8, and the outer seated area to the fluid pressure exist-

ing in chamber 9 which is connected to the brake cylinder through a port 10. The driver's brake valve device is connected to the brake cylinder permanently as far as the supply of fluid to the brake cylinder is concerned, through the port 6, chamber 5, by-pass passage 11, chamber 9, and port 10, a non-return device in the form of a ball 12, being placed in the passage 11.

The operation of the device is as follows: under ordinary conditions the piston 1 is held on its seat by spring 7. When the driver's brake valve is operated, fluid is supplied through port 6, chamber 5, by-pass passage 11, chamber 9, and port 10 to the brake cylinder; some fluid also flows to the brake cylinder through the port 13. The increased fluid pressure in chamber 5 assist the spring 7 in holding the piston 1 down on its seat, preventing



the fluid from escaping to the atmosphere through the port 8. If a gradual release is required, the driver's valve is operated to reduce pressure relatively slowly in chamber 5, and fluid flows from the brake cylinder through port 10, chamber 9, by-pass port 13, chamber 5, port 6, to an exhaust port in the driver's brake valve release, the piston 1 remaining seated during this operation. Should it be necessary to effect a quick release, the driver's brake valve is operated to reduce pressure rapidly in chamber 5, so that a flow of fluid cannot be maintained through the bypass port 13, with the result that piston 1 will be raised from its seat by the brake cylinder pressure acting in the chamber 9 on the outer seated area of the piston, and communication will be established between the brake cylinder and the exhaust port 8.—(Accepted August 20, 1935.)

No. 433,505. Railroads

Daniel Boone Akers, of Griffithsville, County of Lincoln, State of West Virginia, United States of America. September 28, 1934.

A method of railway construction, the rails being carried by a metal support comprising longitudinal members lying under the rails, and reaching from one sleeper to another, and transverse members integral with longitudinal members. The rails 10 may be of conventional form, but instead of flat ends at the joints, complementary zig-zag ends are preferable. By this means one rail end is supported by the

* These abridgments of recently published specifications are specially compiled for THE RAILWAY GAZETTE by permission of the Controller of His Majesty's Stationery Office. Group abridgments can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, either sheet by sheet as issued, on payment of a subscription of 5s. a group volume, or in bound volumes, price 2s. each, and the full specifications can be obtained from the same address price 1s. each.

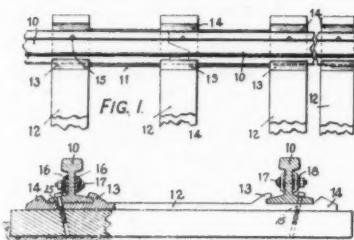


FIG. 2.

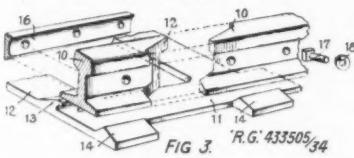


FIG. 3. 'R.G.' 433505/34

other laterally, so that sideways movement of adjoining rail ends under the lateral pressure of the wheel flanges will not occur. As the outer ends of the zig-zag are at right angles to the rail, they form abutting vertical surfaces, and as such resist "creeping," or endwise movement. In a track thus constructed, the rails do not rest directly on the sleepers, but upon metal supports which are interconnected by sleepers, which may be formed separately, or may be made as an integral part of the support. These supports are of a one-piece construction, having two parallel longitudinal members 11, and three transverse bracing members 12, so spaced that they rest on the tops of three sleepers. At the inner edge of each member 11, at each of the sleepers, is a hook-shaped chair 13, that has a vertical side against which the inner edge of the rail base bears and which overlaps the top of the rail base, and thereby the rail under lateral outward thrust of a passing wheel flange, is rigidly restrained from any outward turning movement,

and as on the outer side of the rail base, it engages an upstanding rib 14 on each cross-member 12, it will be seen that the rail regardless of spikes, is rigidly held in place and danger of derailment by spreading rails or overturning rails is eliminated. The outer flange of the rail base is secured to the sleeper by lag screws 15, which pass each through a hole that is drilled or provided in the rail base and an aligning hole that is drilled through the plate member 12, and into an aligning hole bored in the sleeper, going clear through for the purpose of allowing the escape of any water or moisture finding its way into the hole that might result in rotting the sleeper. Screws are used rather than spikes, as the former diminish injury to the sleepers during assembly and hence increase their life. The fishplates 16 are dished or recessed on their sides next the web of the rail, so that they make contact only at the top and bottom, giving them a degree of elasticity, as well as diminishing the quantity of metal required. The fishplate bolts 18 may have some form of locking device such as lock nuts, or spring washers to prevent them working loose due to vibration. — (Accepted August 15, 1935.)

No. 434,851. Improvements Relating to Driving Gear for Railway Turntables

Cowans, Sheldon & Co. Ltd., and John Barrington Pearson, both of St. Nicholas Works, Carlisle. August 16, 1934.

A railway turntable is provided with driving gear, including a motor which derives its motive power from sub-atmospheric pressure produced in the vacuum brake system of the locomotive to be turned, and an accumulator, or several accumulators, which are exhausted by the locomotive, and connected to the motor of the driving gear. The turntable 1 has a tractor or pusher 2, incorporating a motor 3, which derives its motive power from sub-atmospheric pressure produced in the locomotive to be turned. A vacuum accumulator 4, generally in the form of a pair of cylinders of the

type normally used for the storage of air under pressure, is capable of being connected by a pipe line 5 to the motor at the will of the operator. The accumulators are connected to the vacuum brake system of the locomotive by a flexible pipe coupled to the standard vacuum coupling.—(Accepted September 10, 1935.)

COMPLETE SPECIFICATIONS ACCEPTED

431,022. Yarrow, Sir H. E. Water-tube steam boilers.

431,045. Brooker, A. W., and Tyer & Co. Ltd. Means for indicating whether a signal or other lamp is alight or extinguished.

431,070. Williams Limited, H., and Williams, D. D. Railway switchgear.

431,081. Leclair, L. J., Brackenbury, A. G., and Westinghouse Brake & Signal Co. Ltd. Fluid-pressure braking apparatus.

431,210. Siemens & Halske Akt.-Ges. Train-end magnet.

431,289. MacGregor, R. M., Shipp, D. G., and Westinghouse Brake & Signal Co. Ltd. Electric control and indication of point-operating mechanisms for railways and the like.

431,341. Bell Punch Co. Ltd., and Webb, C. F. Ticket-issuing machines.

431,361. Williams Limited, H., and Williams, D. D. Spring-operated crossings, trap points, switches, and the like, for railways, tramways, and the like.

431,426. Churchill Machine Tool Co. Ltd. and Asbridge, H. H. Locomotive crank-pin quartering machines.

431,500. Soc. pour l'Union des Transports Ferroviaires et Routiers. Means for allowing the transport of rolling loads on railway wagons.

431,556. General Railway Signal Company. Relay apparatus for detecting current changes in railway track circuits.

431,806. Noble, E. C., and York, W. D. C. Rail vehicles.

432,117. Stone & Co. Ltd., J., and Vidal, J. F. B. Air filtering and heating equipment for the ventilation of railway and other vehicles.

432,200. Maschinenbau - Akt. - Ges. vorm Ehrhardt & Sehmer. Hot rail bending machines.

432,510. E.M.B. Co. Ltd., Cadbury, G. N., and Smith, S. Bogie trucks for rail vehicles.

432,516. Bonnet, E., and Bostem, G. Chairs for rail joints.

432,610. E.M.B. Co. Ltd., Cadbury, G. N., and Smith, S. Brakes for rail vehicles.

432,702. Tennant, W. J. (Aktiebolaget Svenska Kullagerfabriken). Bearings for railway-vehicle axles.

432,986. Danks & Co. (Oldbury) Ltd., E., and Henry, J. Steam boilers of the cylindrical-shell type.

433,514. Budd Manufacturing Company, E. G. Railway trucks or bogies.

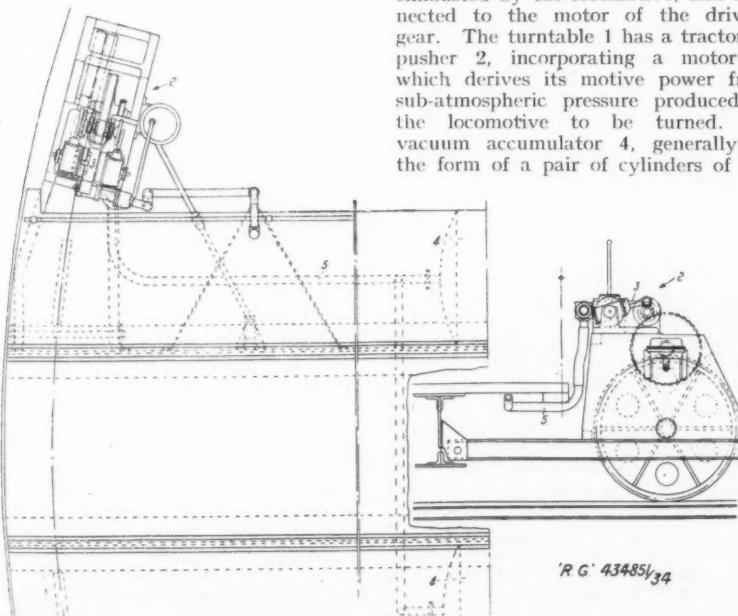
433,530. Presland, C. W. Apparatus for tipping and discharging railway wagons.

433,602. Main, D. W. Vehicles adapted for alternative rail or road use.

433,623. Pitner, A., and Soc. Anon. des Roulements à Aiguilles. Axle boxes with needle bearings.

433,821. Wicinski, A., and Bujak, J. Z. Supercharging of diesel engines.

433,923. Vereinigte Kugellager-Fabriken Akt.-Ges. Coupled driving wheels for locomotives.



November 22, 1935

CONTRACTS AND TENDERS

Beyer, Peacock & Co. Ltd. has received an order from the San Paulo Railway for one spare boiler required for express passenger Beyer-Garratt type locomotives.

Locomotives for Palestine

Nasmyth, Wilson & Co. Ltd. has received an order from the Crown Agents for the Colonies for two standard-gauge 0-6-0 shunting tank locomotives for the Palestine Railways. These locomotives will be similar to those ordered in April of this year and July of last year from the same builders for this railway, and fully described in THE RAILWAY GAZETTE of August 9.

Brazilian Power Station Order

In this column of our August 9, 1935, issue, page 242, it was recorded that the Federal Government was inviting tenders for the supply and installation of a diesel-electric power station at Engenho de Dentre to provide power provisionally for the first section of the electrified Central Railway of Brazil until the projected hydro-electric station was erected, and thenceforth to be used as a reserve plant. The contract for the construction of this provisional power station has now been awarded to R. Peterson & Co. Ltd.

Dean, Smith & Grace Limited has received an order for two motor-driven high-speed lathes for the Central Uruguay Railway.

The South Indian Railway Administration has placed the following orders to the inspection of Messrs. Robert White & Partners:—

Greenwood & Batley Limited: Bolt and general forging machine.

Kendal & Gent Limited: Screwing machine.

Ferguson & Palin Limited: High tension switchgear.

Craven Bros. (Manchester) Limited has received orders from the Buenos Ayres Great Southern Railway for two motor-driven portable crank pin returning machines and one electrically-driven heavy duty improved locomotive wheel lathe.

The Glasgow Railway Engineering Co. Ltd. has received an order from the Egyptian State Railways Administration for axles. (Ref. E.S.R. 21,393), total price £506 5s. f.o.b. Glasgow.

The Egyptian State Railways Administration has placed orders for steel sleepers and accessories, as follow:—

Stahlwerks-Verband A.G.: 75,000 steel sleepers, at approx. L.E.5 per metric ton, delivery quay, Alexandria.

Usines et Boulonneries Hermant Higuet: 245 metric tons clips, at total price of approx. L.E. 2,841, f.o.b. Antwerp.

Cloutier et Trefilerie des Flandres: 150 metric tons clippolts and nuts, at approx. L.E. 11 per ton, delivery quay, Alexandria.

The Morgan Crucible Co. Ltd. has received an order from the Buenos Ayres Great Southern Railway for four oil-fired tilting furnaces complete with direct coupled electric motor fans.

The Indian Stores Department has placed orders with Burn & Co. Ltd. and Guest Keen Williams Limited for points, crossings and switches under tender No. N 5166.

Diesel Railcar Orders

Ganz & Co., of Budapest, has received an order from the Roumanian State Railways for 40 diesel engines and mechanical transmission sets for 150 b.h.p. railcars, the bodies for which are being built in Roumania. Ganz & Co. has also received an order from the Rhodesia Railways for a double-bogie diesel car of 300 b.h.p., and from the Nord-Belge Railway for two 250 b.h.p. diesel cars.

The Renault Company, of Billancourt, Paris, has received orders from the Madrid, Zaragoza & Alicante Railway for six 100-b.h.p. four-wheeled and four 265-b.h.p. double-bogie diesel-mechanical railcars. Both types are for use on the Spanish standard (5-ft. 6-in.) gauge lines. The Renault organisation has also received an order for six 265-b.h.p. diesel-mechanical 5-ft. 6-in. gauge cars from the Northern Railway of Spain.

The Fiat Company, of Turin, has received an order for six 280-b.h.p. diesel Littorina railcars from the Madrid, Zaragoza & Alicante Railway, and a further order for six similar vehicles from the Northern Railway of Spain.

Locomotives Required for Egypt

Tenders are invited by the Egyptian State Railways Administration, receivable at the General Management, Cairo station, by January 15, 1936, for the supply of 15 standard gauge 2-4-2 side tank locomotives.

Wagons required for India

Tenders are invited, receivable by January 3, 1936, at the office of the Director, Mechanical Engineering, Railway Board, New Delhi, for the supply by wagon-building firms in India and elsewhere of the following I.R.S. broad and metre-gauge goods wagons without wheels and axles, to be delivered in India between April 1, 1936, and March 31, 1937:—

Broad gauge:
400, 900 or 1,500 type O four-wheeled open wagons.
100 type OM four-wheeled open wagons.
400, 800 or 1,200 type CR four-wheeled covered wagons.

100 or 200 type CMR four-wheeled covered wagons.
14 type TP four-wheeled petrol tank wagons.
72 or 97 TO type four-wheeled oil tank wagons.

Metre gauge:
100 MCJ type four-wheeled covered wagons.

Leyland Motors Limited has received the following orders from railway-associated road transport operators: Maidstone & District Motor Services Limited, 17 oil-engined Titan and 20 oil-engined Tiger passenger vehicles; Hebble Motor Services Limited, two oil-engined Titan passenger vehicles; East Midland Motor Services Limited, seven oil-engined Titan passenger vehicles; Scottish Motor Traction Co. Ltd., 60 oil-engined Cheetah passenger vehicles; W. Alexander & Sons Ltd., 116 oil-engined Cheetah passenger vehicles; Western S.M.T. Co. Ltd., 100 oil-engined Cheetah passenger vehicles; Central S.M.T. Co. Ltd., 24 oil-engined Cheetah passenger vehicles; London Passenger

Transport Board, two Cub passenger vehicles; Hants & Dorset Motor Services Limited, six Cub passenger vehicles; Southdown Motor Services Limited, six Cub passenger vehicles.

The Associated Equipment Co. Ltd. has received an order from the South African Railways and Harbours Board for two oil-engined M.A.N.-Mammoth Major 6 heavy goods vehicles.

The Vaughan Crane Co. Ltd. has received an order from the Buenos Ayres Great Southern Railway for one three-motor overhead electric travelling crane.

The East Indian Railway Administration has placed the following orders for machine tools:—

Associated British Machine Tool Makers Limited: One Holroyd axle journal re-turning, burnishing and wheel boss facing machine with motor; one Parkinson No. 2P double overarm horizontal milling machine with roller bearings; and one Parkinson No. 2J all-gear universal milling machine with roller bearings.

Alfred Herbert (India) Limited: Four sliding, surface and screwcutting gap bed lathes, 12 ft. 6 in., by 12 ft., with 24 in. four-jaw independent chuck; three Kitchen & Wade 36-in. radial drilling, boring, tapping and studding machines with portable box tables; one Ormerod 26-in. stroke high speed cone driven shaping machine; one Dean Smith & Grace 10½ in. by 10 ft. CN sliding, surfacing and screwcutting gap bed lathe; and one oxy-acetylene welding and cutting plant.

Craven Bros. (India) Limited: One Craven slot Hydronil 12 in. by 1 in. by 3 in.

Machine Tools (India) Limited: One Greenwood & Batley spring eye rolling machine complete with motor.

Francis Klein: One Wagner size DF hydraulic cold sawing machine, complete with motor, and two sets Hoofha D direct pressure sand blast apparatus.

H. J. Skelton & Co. Ltd. on behalf of Usines et Boulonnneries de Mariemont has received an order from the Argentine North Eastern Railway for 100,000 mild steel dogspikes.

Forthcoming Events

Nov. 20-30.—International Exhibition of Inventions, at St. George's Drill Hall, Newcastle.

Nov. 22 (Fri.).—R.O.D. Re-Union Dinner, at Trocadero Restaurant, Piccadilly Circus, S.W.1.

Institution of Mechanical Engineers, Storey's Gate, S.W.1, 6 p.m. General Meeting.

Nov. 25 (Mon.).—G.W.R. (Birmingham) Lecture and Debating Society, at Great Western Hotel, Snow Hill Station, 6.30 p.m. "Another Picture of the Railway Future," by Mr. W. A. Wilcox.

Institution of Mechanical Engineers (Graduate), Storey's Gate, S.W.1, 6.45 p.m. "Oil," by Mr. R. A. Robbins.

Nov. 26 (Tues.).—Institute of Transport (Birmingham Graduate), at Imperial Hotel, 6.30 p.m. "The Clearing House System in Road Transport," by Mr. G. A. Major.

Electrical Industries Benevolent Association Ball, at Grosvenor House, Park Lane, W.I. L.N.E.R. (Newcastle-Sunderland) Lecture and Debating Society, at Sunderland, 7 p.m. "Tendencies in Modern Journalism," by Mr. W. G. Willis.

Nov. 27 (Wed.).—Institute of Metals (London), at Thames House, Millbank, S.W.1, 7.30 p.m. Supper Dance.

L.N.E.R. (Darlington) Lecture and Debating Society, at North Road Institute, 7.30 p.m. "The Work of the Railway Chemist," by Mr. H. A. Houston.

Nov. 28 (Thurs.).—Institution of Locomotive Engineers (London), at Institution of Mechanical Engineers, Storey's Gate, S.W.1, 6 p.m. "Railcars in Service in Northern Ireland," by Mr. A. Allen.

Nov. 29 (Fri.).—L.N.E.R. (London) Musical Society, at Hamilton Hall, Liverpool Street, E.C.2, 8 p.m. Bohemian Concert.

Institute of Transport (Manchester-Liverpool), at Manchester, 6.30 p.m. Visit of the President.

OFFICIAL NOTICES

REQUIRED for large European Rolling Stock Works in India, a WORKS INSPECTOR to take charge of Inspection Dept. Age 25 to 35 years, preferably single. Should have had similar experience in large modern works and be competent to undertake the inspection and testing of all materials, component parts, and complete steel carriage frames and steel wagons. Should have had good technical education. Five-year agreement; free passages; provident fund; free unfurnished quarters; salary according to qualifications. Apply by letter with copies of testimonials, stating age and whether married or single, to "WAGON," c/o W. Abbott, LTD., 32, Eastcheap, London, E.C.3.

"A Hundred Years of Railway History"

"A hundred years of railway history" was the title given to this year's Paris exhibition of railway models, old railway pictures, drawings and caricatures, organised by the Association Française des Amis des Chemins de Fer. The show was held from November 14 to 17 in a spacious hall at 19, rue Traversière, Paris, lent by the P.L.M. Company. It was one of the most successful model exhibitions yet seen in Paris, and it attracted large numbers of the general public, as well as numerous conducted parties of boys and girls from the schools.

A century of railway progress was well illustrated by large scale models sent by French and foreign railways, as well as by amateur model engineers. A prominent feature was the fine selection of about 400 working models of locomotives brought from London by six members of the Model Railway Club. This exhibit, conveyed in a container, did not arrive in Paris until 9.30 a.m. on the opening day, but by 11.30 a.m. everything was in its place. It represented a smart piece of work by the six energetic members who opened all the cases for Customs inspection and then transported them to the hall. Before noon French youngsters were enjoying trips to and fro astride the trucks of the train on the passenger-carrying miniature railway of the London Society of Model and Experimental Engineers. They showed keen interest in all details of the coal-fired steam locomotive, hauling the trucks at a speed of at least five miles an hour.

Transportable Substations

Among the many interesting exhibits were two models of transportable substations, with their transformers mounted on bogie frames as used on the Italian electrified railways. One was for direct current and the other for three-phase working. The actual substations can readily be run to any point on the lines to give aid in case of breakdown. The P.O.-Midi showed two working models of its electric railcars and locomotives. A level crossing red light with the warning "Train is coming," automatic block system, colour-light signals, and photo-electric automatic train control, were on view and constantly operated by throngs of boys.

An excellent model of the Mulhouse-

South Indian Railway Company Limited

THE Directors are prepared to receive Tenders for the supply of—
M.S. SECTIONS, BARS, &c.
Specifications and Forms of Tender will be available at the Company's Offices, 91, Petty France, Westminster, S.W.1.
Tenders addressed to the Chairman and Directors of the South Indian Railway Company Limited, marked "Tender for M.S. Sections, Bars, &c.", with the name of the firm tendering, must be left with the undersigned not later than 12 Noon on Friday, the 6th December, 1935.

The Directors do not bind themselves to accept the lowest or any Tender.

A charge, which will not be returned, will be made of 10s. for each copy of each Specification.

E. A. S. BELL,
91, Petty France, Managing Director.
Westminster, S.W.1.
20th November, 1935.

Universal Directory of Railway Officials and Railway Year Book

Price 20/- net.
THE DIRECTORY PUBLISHING CO. LTD.,
33, Tothill Street, London, S.W.1.

ville station to a scale of 1:200, executed by "Les Maquettes Perfecta," was part of the exhibit of the Alsace-Lorraine State Railways. The Moroccan Railways showed models of their characteristic white stations. A longitudinal section of a locomotive boiler, made by apprentices, was among the exhibits of the Eastern Railway, while the State Railway apprentices had on view a similar model of a locomotive for heavy trains built to scale. The exhibition also included numerous models of steam and electric locomotives of the latest types, petrol and diesel motors and railcars, including one of the Bugatti type.

Freight Rebates Scheme

Mr. I. Buchanan Pritchard applied on Monday, November 18, on behalf of the four amalgamated railway companies, to the Railway Rates Tribunal for an adjournment of the review of the Railway Freight Rebates Scheme until after the decision in the Southern Railway rating appeal which was being opened in the House of Lords on that day. This decision would go to the very root of the question of rate relief, and of the estimate of rate relief on which the amount of rebates to be allowed would largely depend. He submitted, and was supported by Mr. Jacques Abady, K.C., who appeared for other parties, in that submission, that in the circumstances the tribunal had a discretion and had full power to adjourn beyond the date prescribed in paragraph 10 (1) of the eleventh schedule to the Local Government Act, 1929.

The President (Mr. W. Bruce Thomas, K.C.) said all the members of the Court would very much like to be able to do what they were asked to do. They felt, however, that the Act expressly directed them to review and to make any order that might have to be made upon such review within two months from September 30. If it was not possible to hold the review within that period, then no doubt they would not be prevented from holding the review at the earliest possible date thereafter, but they did not consider that these were the circumstances at the moment. They could not adjourn the review until after the decision of the House of Lords, but the hearing would be adjourned until November 27.

Railway and Other Reports

Pullman Car Co. Ltd.—The directors recommend a dividend of 2½ per cent. on the 7 per cent. cumulative preference shares on account of arrears.

Argentine Transandine Railway.—Results of working for the year to June 30, 1935, show a debit balance on revenue account of £11,000, but interest on investments, transfers from reserve, &c., reduce the debit balance to £1,885. Debenture stock interest, however, and interest on arrears of debenture interest, less a transfer from the "A" debenture stock guarantee fund, leave £26,489 as the debit to be carried to the balance sheet. Floods experienced in January, 1934, caused a total suspension of rail traffic until August, 1934. The destruction by floods account is bearing the cost of surveys for the reconstruction of the line, but further heavy charges in this connection for the time being are not anticipated.

Argentine Great Western Railway.—The report for the year ended June 30 states that under the working agreement the company received £68,000 from the Buenos Ayres & Pacific Railway Company and applied it to meeting the interest on first debenture stock. In consequence of the continued heavy losses on exchange, the Buenos Ayres & Pacific Railway Company was unable to pay anything on account of the arrears of interest and dividend on the company's debenture and guaranteed stocks, the payment of which was postponed under the scheme of arrangement of July, 1932. The moratorium period in respect of the interest on the 4 per cent. second debenture stock and the 5 per cent. debenture stock and the dividend on the 6 per cent. guaranteed preference stock has been extended to June 30, 1936, the stockholders' committee having power to extend it from time to time up to June 30, 1938. On August 2 last the company received £102,000 from the Buenos Ayres & Pacific Railway Company, and with that amount distributed 6 per cent. on account of arrears of interest on the 4 per cent. second debenture stock for one and a half years ended June 30, 1933.

W. T. Henley's Telegraph Works Co. Ltd.—The directors announce an interim dividend on the ordinary shares of 7½ per cent., payable on December 2.

Railway Share Market

The stock and share markets responded strongly at the opening of business on Monday to the large majority obtained by the National Government, but there was subsequently a fairly large amount of profit-taking which caused prices to react from the best. In home and foreign railways there was a very good undertone and brokerage firms report that investors are once more turning their attention to railway stocks. London & North Eastern issues were exceptionally depressed by the fears of trouble in the coal industry, and these off-set the promise of big traffic increases resulting from development schemes reported to be in hand for the north-eastern areas. The good iron and steel trade reports are expected to encourage further buying of the preference

stocks of the company. L.M.S. issues and Great Western ordinary were also slightly reactionary, and Southern preferred and deferred, after early steadiness pending the outcome of the appeal to the House of Lords against reduction of the company's rating assessment, tended to go back with other stocks on Wednesday when the strike ballot results were issued. The market reports more buyers, but of a smaller average amount of stock per head. The market welcomes this development, as a wide distribution of stocks in small average amounts assists towards a "free market." London Transport "C" stock maintained its advance to 106 on the current estimate that the stock may receive the full statutory dividend of 5½ per cent. within the next year

or two. Foreign railway stocks attracted much wider attention. The demand for Argentine railway ordinary and preference issues was buoyant at one time on news of important steps towards restoration of a free exchange. The big rise over the past week brought in profit-takers, but the amount of stock sold was very small.

The market is talking B.A. Great Southern, B.A. Western, B.A. Pacific and Central Argentine ordinary stocks to much higher prices during the next six months. There has also been unusual activity in Leopoldina ordinary stock, although little has transpired to throw light on the position. In some quarters it is suggested the Government is making concessions to assist the railway.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

Railways	Miles open 1934-35	Week Ending	Traffics for Week		No. of Weeks	Aggregate Traffics to Date			Shares or Stock	Prices					
			Total this year	Inc. or Dec. compared with 1934		Totals		Increase or Decrease		Highest 1934	Lowest 1934	Nov. 20, 1935	Yield % (See Note)		
						This Year	Last Year								
Antofagasta (Chili) & Bolivia	830	17.11.35	£13,310	- 7,210	46	£57,190	£67,240	+ 105,450	Ord. Stk.	2634	19	19	Nil		
Argentine North Eastern	753	16.11.35	8,208	+ 619	20	164,989	152,753	+ 12,236	A. Deb.	11	678	512	Nil		
Argentine Transandine	—	—	—	—	—	—	—	—	6 p.c. Deb.	52	45	48	8% ¹⁶		
Bolivar	—	174	Oct., 1935	5,300	43	60,600	59,950	+ 650	Bonds.	10	612	10	4% ¹⁶		
Brazil	—	—	—	—	—	—	—	—	Ord. Stk.	1612	812	9	Nil		
Buenos Ayres & Pacific	2,806	16.11.35	72,855	+ 1,242	20	1,472,897	1,367,851	+ 105,046	Mt. Deb.	23	10	16	Nil		
Buenos Ayres Central	190	2.11.35	\$126,500	+ \$8,809	18	\$2,251,300	\$2,322,160	- \$70,800	Ord. Stk.	35	22	20	Nil		
Buenos Ayres Gt. Southern	5,085	16.11.35	112,926	- 10,358	20	2,375,049	2,412,802	- 37,753	Mt. Deb.	103	95	103	Nil		
Buenos Ayres Western	1,930	16.11.35	45,123	+ 548	20	783,405	814,754	- 31,349	Ord. Stk.	2112	1812	1612	Nil		
Central Argentine	3,700	16.11.35	116,384	+ 12,965	20	2,355,517	2,360,231	- 4,714	Dfd.	23	1312	12	Nil		
Do.	—	—	—	—	—	—	—	—	Ord. Stk.	1512	3	512	Nil		
Cent. Uruguay of M. Video	273	16.11.35	14,509	+ 3,033	20	183,049	345,142	- 162,093	Ist Pref. Stk.	1/—	1/—	2	Nil		
Do. Eastern Extn.	311	16.11.35	2,428	+ 386	20	28,918	31,787	- 2,869	Ord. Stk.	1234	788	812	Nil		
Do. Northern Extn.	185	16.11.35	1,367	+ 258	20	21,834	17,730	+ 4,104	Pr. Li. Stk.	6	3	2	Nil		
Do. Western Extn.	211	16.11.35	885	- 201	20	15,110	14,735	+ 375	Pr. Li. Stk.	3054	2312	34	57 ⁸		
Cordoba Central	1,218	16.11.35	26,910	+ 660	20	618,350	609,080	+ 9,270	Ord. Inc.	1458	314	112	Nil		
Costa Rica	—	188	Sept., 1935	13,313	13	3,371	43,715	- 49,839	Stk.	112	12	12	Nil		
Dorada	—	70	Oct., 1935	11,908	43	200	117,460	- 102,400	1 Mt. Db.	103	95	10212	57 ⁸		
Entre Rios	810	16.11.35	10,364	- 2,663	20	233,547	227,491	+ 6,056	Ord. Stk.	2112	12	10	Nil		
Great Western of Brazil	1,082	16.11.35	9,900	- 5,000	46	349,560	393,700	- 44,200	Ord. Sh.	78	58	58	Nil		
International of Cl. Amer.	794	Sept., 1935	\$284,242	+ \$4,429	39	\$3,549,252	\$3,639,904	- \$90,652	Pr. Li. Stk.	84	67	7712	75 ⁴		
Interoceanic of Mexico	—	—	—	—	—	—	—	—	Ist Pref. Stk.	1/—	1/—	2	Nil		
La Guaira & Caracas	225 ⁴	Oct., 1935	2,900	- 300	43	37,885	36,065	+ 1,820	Pr. Li. Stk.	1458	7	72	Nil		
Leopoldina	—	1,918	16.11.35	19,032	46	460	822,919	- 1,023,308	Pr. Li. Stk.	200,389	7	72	Nil		
Mexican	483	14.11.35	\$249,900	- \$12,300	19	\$4,775,100	\$4,400,566	+ \$374,600	Pr. Li. Stk.	314	112	12	Nil		
Midland of Uruguay	319	Oct., 1935	6,499	- 6,439	17	22,345	38,789	- 16,444	Ord. Stk.	112	12	12	Nil		
Nitrato	401	15.11.35	3,873	- 3,394	45	130,837	117,519	+ 13,318	Ord. Sh.	3282	51/—	228	Nil		
Paraguay Central	274	9.11.35	\$1,949,000	+ \$1,006,000	19	\$36,569,000	\$18,370,000	+ \$18,199,000	Pr. Li. Stk.	84	67	7712	75 ⁴		
Peruvian Corporation	1,059	Oct., 1935	81,893	+ 17,486	17	299,665	230,845	+ 48,820	Pr. Li. Stk.	1458	8	10	Nil		
Salvador	—	100	9.11.35	€12,275	19	€22,321	€180,946	+ €45,651	Pr. Li. Stk.	75	70	65	7116		
Sao Paulo	153 ²	10.11.35	24,115	- 3,365	45	1,145,739	1,217,413	- 71,674	Ord. Stk.	86	67	46	57 ¹⁶		
Talca	—	164	Oct., 1935	3,390	17	1,090	12,640	- 9,205	Ord. Sh.	218	1716	158	714		
United of Havana	1,353	16.11.35	12,497	- 2,975	20	316,888	330,970	- 14,112	Ord. Stk.	6	2	2	Nil		
Uruguay Northern	73	Oct., 1935	765	- 367	17	2,527	4,444	- 1,917	Deb. Stk.	614	3	412	Nil		
Canadian	23,697	14.11.35	708,248	+ 87,688	45	30,029,311	28,812,773	+ 1,216,538	—	—	—	—	—		
Canadian Northern	—	—	—	—	—	—	—	—	4 p.c. Perp. Dbs.	7814	5112	66	61 ¹⁶		
Grand Trunk	—	—	—	—	—	—	—	—	4 p.c. Gar.	10412	9714	9912	4		
Canadian Pacific	17,224	14.11.35	530,000	+ 22,800	45	22,349,200	21,778,000	+ 571,200	Ord. Stk.	18516	11118	12	Nil		
India, f	—	—	—	—	—	—	—	—	—	—	—	—	—		
Assam Bengal	1,329	31.10.35	43,410	- 2,485	30	707,308	821,333	- 114,025	Ord. Stk.	8812	72	8012	35 ⁴		
Barsi Light	202	20.10.35	2,482	- 143	29	75,997	80,332	- 4,335	Ord. Sh.	10412	9854	7812	63 ⁸		
Bengal & North Western	2,114	31.10.35	65,028	- 4,802	4	186,440	185,221	+ 1,219	Ord. Stk.	29712	262	29612	53 ⁸		
Bengal Dooars & Extension	161	20.10.35	4,999	- 374	29	74,526	84,392	- 9,866	Ord. Stk.	12514	124	12312	51 ¹⁶		
Bengal-Nagpur	3,268	10.10.35	171,000	+ 13,553	27	3,309,999	3,052,936	+ 257,063	Ord. Stk.	10512	96	10312	37 ⁶		
Bombay, Baroda & C. India	3,072	10.11.35	229,800	+ 7,725	32	4,741,425	4,741,425	-	Ord. Stk.	115	10812	11212	55 ¹⁶		
Madras & South Mahratta	3,230	20.10.35	134,775	- 2,414	29	2,945,060	3,246,841	- 301,781	Ord. Stk.	131	12284	12012	77 ⁸		
Rohilkund & Kumaon	546	31.10.35	11,616	- 791	4	32,713	34,645	- 1,932	Ord. Stk.	263	250	29312	57 ¹⁶		
South India	2,526	10.10.35	114,611	- 15,540	27	2,148,961	2,262,265	- 113,304	Ord. Stk.	119	115	10912	7		
Beira-Umtali	204	Sept., 1935	59,616	- 3,871	52	769,888	651,264	+ 118,624	Deb. Stk.	50	33	37	97 ¹⁶		
Bilbao River & Cantabrian	15	Oct., 1935	1,695	+ 1,171	43	15,053	16,719	- 1,666	Deb. Stk.	101	9154	102	47 ⁸		
Egyptian Delta	622	31.10.35	12,037	+ 2,190	30	133,573	130,946	+ 2,627	Prf. Sh.	21316	134	134	511 ¹⁶		
Great Southern of Spain	104	9.11.35	2,093	- 65	45	81,375	100,658	- 19,283	Inc. Deb.	4	312	312	Nil		
Kenya & Uganda	1,625	Sept., 1935	166,857	+ 17,443	39	1,808,941	1,694,916	+ 114,025	Deb. Stk.	—	—	—	—		
Manila	—	—	—	—	—	—	—	—	B. Deb.	50	33	37	97 ¹⁶		
Mashonaland	913	Sept., 1935	106,693	- 7,903	52	1,384,055	1,191,218	+ 192,837	1 Mg. Deb.	101	9154	102	47 ⁸		
Midland of W. Australia	277	Sept., 1935	14,150	+ 512	13	37,202	39,590	- 2,388	Inc. Deb.	100	93	9412	55 ¹⁶		
Nigerian	—	1,905	28.9.35	18,504	- 11,373	26	594,657	676,321	- 81,664	—	—	—	—		
Rhodesia	—	1,538	Sept., 1935	193,326	+ 10,016	52	2,319,058	1,992,128	+ 326,930	4 p.c. Db.	10478	9712	10312	37 ⁸	
South African	—	13,246	26.10.35	593,108	+ 60,570	30	16,623,436	15,093,038	+ 1,530,398	—	—	—	—		
Victorian	—	4,728	Aug., 1935	736,134	+ 4,008	9	1,449,523	1,433,140	+ 16,383	—	—	—	—		
Zafra & Huelva	—	112	Sept., 1935	12,860	- 1,697	39	101,435	102,566	- 1,131	—	—	—	—		

NOTE.—Yields are based on the approximate current prices and are within a fraction of 116.

† Receipts are calculated @ Is. 6d. to the rupee. § ex dividend. Salvador and Paraguay Central receipts are in currency.

The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the Sterling weekly receipts at the par rate of exchange has proved misleading, the amount being overestimated. The statements from July 1 onwards are based on the current rates of exchange and not on the par value